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This issue mailed May 15, 1954

It is with a feeling of deep regret and irreparable loss that we must report the death of Paul B. Lawson on March 30, 1954. He was chairman of the publication committee of this Journal from its beginning and its editor from Vol. 3 (1930) to his death. The Kansas Entomological Society, at its thirtieth annual meeting held on April 17, 1954, at the University of Nebraska, unanimously passed the following motion: "That the picture of Paul B. Lawson be placed on the cover of the Journal, and that notice of this action be published in the Journal."

A biographical sketch will be prepared for the next issue by H. B. Hungerford.

Kansas Entomological Society
Vol. 27 April, 1954 Number 2

CONCERNING *PANGAEUS BILINEATUS* (SAY) (Hemiptera: Pentatomidae, subfamily Cydninae)

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Pangaeus bilineatus (Say) is the most common of the larger species of cydnids, or burrowing bugs, found in the United States. In recent years this species has been suspected as a vector of certain virus diseases which appear to enter plants through their roots. In addition it has also been reported as causing serious injury to vegetable seedlings and to strawberries.

For many years it has been known that *P. uhleri* Signoret could not readily be separated from *bilineatus;* however, the name *uhleri* continued in use for a smaller form with a distribution restricted to the Southeastern States. *P. bilineatus,* the larger form, has been listed as being distributed over the southern and central United States west to Arizona and into Mexico.

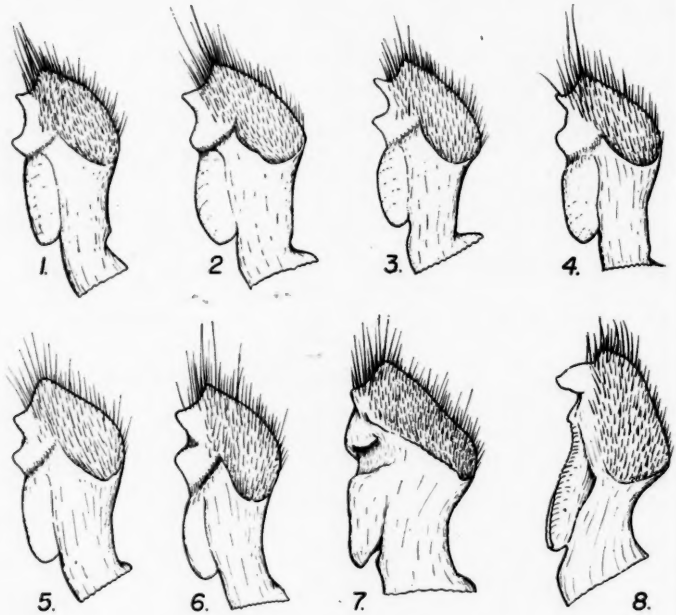
A study of the material in the U.S. National Museum collection shows that *P. uhleri* canot be separated from *bilineatus.* This conclusion is supported by the absence of any character or combination of characters that will serve to separate the two forms. While *bilineatus,* as treated in this paper, admittedly shows a remarkable variation in size and some variation in structure, the differences shown by separate populations grade insensibly from one extreme to the other.

A series from a given locality taken on the same date is usually uniform in size and structure, though it may differ noticeably from populations taken at the same locality in other years. Such variations in structure as are readily apparent seem to be those necessitated by the mechanical problem of moving bodies of different size through the soil. The best example of this type of structural variation is the "more expanded apical half of the front tibia" referred to by Blatchley (1926). This difference is pronounced when extremes of size are compared, but is lost in the intermediates. There is little reason to doubt that the degree to which the apical half of the fore tibiae is expanded is proportional to the musculature required to propel the insect through the soil. In the larger individuals this expansion is almost lost as a result of the greater diameter of the basal portion of the tibia.

It seems probable that local ecological conditions largely determine how much a series will deviate from the mean for the species. Presumably the large form, *bilineatus* old sense, represents the development of the species under optimum conditions, whereas *uhleri* is the product of minimal growth conditions. Although it is true that the smaller forms occur most frequently in the Southeastern and Southern States, where the species appears most common, small specimens are encountered throughout its range. This seems to eliminate the possibility of some segregation of two populations, as is suggested by older distribution records.

Morphological evidence that *bilineatus* and *uhleri* are identical is provided by a comparison of the male genitalia. In the genus *Pangaeus* the shape of the clasper is distinctive for the different species. In no case have the claspers of the various forms of *bilineatus* from different localities shown significant differences. (See figs. 1 through 6). There is little difference in size between a clasper taken from the smallest individual and from the largest, though the bulk of the largest specimen is more than twice that of the smallest.

The original description of *P. fortis* (Walker) and subsequent description and illustration by Signoret and Distant provide no evidence that this



EXPLANATION OF FIGURES

All drawings are of the right genital clasper.

Pangaeus bilineatus (Say)

1. From Washington, D. C.; *P. uhleri,* vide H. G. Barber.
2. From Germania, Pa.; *P. bilineatus,* vide H. G. Barber.
3. From Raleigh, N. C.; *P. uhleri,* vide H. G. Barber.
4. From Florence, S. C.; *P. uhleri,* vide P. P. Uhler.
5. From "Arizona"; *P. bilineatus,* vide R. I. Sailer.
6. From Presidio Riv. near Union, Sinola, Mexico; *P. bilineatus,* vide R. I. Sailer.
7. From "Arizona;" *P. descrepans* Uhler, vide R. I. Sailer.
8. From "Columbia"; *P. serripes* (Westwood) (=*P. margo* (Dallas), the type species of *Pangaeus*), vide R. I. Sailer.

species is distinct from *bilineatus*. Since the range of distribution for *bilineatus* includes the type locality of *fortis*, it seems probable that this species is a synonym of *bilineatus* and it is so treated in the following list of literature references.

For purposes of comparison a clasper of each *Pangaeus serripes* (Westwood) and *P. descrepans* Uhler are also illustrated. (See figs. 7 and 8.)

Distribution of *P. bilineatus* (Say): Atlantic coast from Florida to New York, west through Ohio to southern Wisconsin, southwest through eastern Nebraska to Kansas, southwest across New Mexico and Arizona to Imperial Valley, California, and finally south through lower California, Mexico, and Guatemala. The only insular record for the species is Bermuda, where it appears to be common.

Provancher (1885) recorded finding a single specimen in Quebec. Uhler (1877) reported the species from Massachusetts and Connecticut. These specimens have not been seen and no additional specimens have been reported since.

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Taxonomic references:

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Cydnus bilineatus var. *picea* Say, 1832, Heteropterous Hemipt. No. Amer., New Harmony, p. 10; Fitch reprint 1857 *in* Trans. N. Y. State Agr. Soc., 17: 756; Say, Compl. Writ. by Le Conte 1859; vol. 1, p. 322.

Cydnus femoralis Herrich-Schaeffer, 1839, Wanz. Ins. vol. 5, p. 98, fig. 548.

Aethus bilineatus Dallas, 1851, List of Hemip., vol. 1, p. 119; Dohrn, 1859, Cat. Hemip., p. 9; Glover, 1876, Illustrations of Insects, Order Hemiptera-Heteroptera, p. 21.

Aethus fortis Walker, 1867, Cat. Heterop., vol. 1, p. 151. (NEW SYNONYMY).

Aethus robertsoni Uhler, Bul. U. S. Geol. Geog. Surv., 3(2):384 (a Fitch MS. name validated).

Pangaeus bilineatus Stal, 1876, Enum. Hemipt., vol. 5, p. 19; Uhler, 1876, Bul. U. S. Geol. Geog. Surv., vol. 1, p. 275; Uhler, 1876, Bul. U. S. Geol. Surv. 2 (5):9; Uhler, 1877, Bul. U. S. Geol. Geog. Surv. 3(2):383-384; Uhler, 1878, Proc. Boston Soc. Nat. Hist. 19: 371-372; Distant, 1880, Biol. Centr. Amer., vol. 1, p. 6; Provancher, 1880, Pet. Faune Ent. Can., vol. 3, p. 28.

Pangoeus bilineatus Signoret, 1882, Ann. Soc. Ent. Fr., Ser. 6, 254-255, pl. 9, fig. 113.

Pangaeus bilineatus Uhler, 1886, Check List Hemipt. Heteropt. No. Amer., p. 3; Lethierry and Severin, 1893, Cat. Hemipt., tome 1, p. 69; Van Duzee, 1904, Trans. Amer. Ent. Soc. 33:24; Barber, 1906, Brokl. Inst. Sci. Bul. 1:256; Banks, 1910, Cat. Nearctic Hemipt.-Heteropt., p. 100; Smith, 1910, Cat. Ins. N. J., Ed. 3, p. 133, published as part of 9th Report of N. J. State Museum; Van Duzee, 1912, Can. Ent. 44:318; Zimmer, 1912, Univ. Neb. Studies, 9:242; Van Duzee, 1916, Check List p. 3; Van Duze, 1917, Cat. Hemipt. No. Amer., p. 21; Stoner, 1920, Iowa Univ. Studies in Nat. Hist. 8 (4):36-37; Parshley, 1923, *in* Hemipt. of Conn. by Britton, p. 779; Blatchley, 1826, Heteropt. East No. Amer., pp. 74-75; Barber, 1928, *in* List Insects New York by Leonard, p. 77; Brimley, 1938, Insects of N. Carolina, p. 61; Froeschner, 1941, Amer. Midland Naturalist 26:141; Smith, 1943, Kansas State Bd. Agr. Report 62(255):157; Moore, 1950, Le Nat. Canadien 77:235.

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Pangaeus fortis Uhler, 1877, Bul. U. S. Geol. and Geog. Surv. 3 (2):389; Distant, 1880, Biol. Centr. Amer., vol. 1, pp. 6-7, pl. 3, fig. 8;

Pangoeus fortis Signoret, 1882, Ann. Soc. Ent. Fr., Ser. 6, 2:246-247, pl. 8, fig. 105.

Pangaeus fortis Uhler, 1886, Check List Hemipt. Heteropt. No. Amer., p. 3; Lethierry and Severin, 1893, Cat. Hemipt., tome 1, p. 69.

Pangaeus rugifrons (not Herrich-Schaeffer) Uhler, 1877, Bul. U. S. Geol. and Geog. Surv. 3(2):384-385.

Pangaeus uhleri Uhler, 1886, Check List Hemipt. Heteropt. No. Amer., p. 3; Van Duzee, 1904, Trans. Amer. Ent. Soc. 33:25; Bueno and Brimley, 1907, Ent. News 18:441; Banks, 1910, Cat. Nearctic Hemipt.-Heterop., p. 101; Van Duzee, 1916, Check List Hemipt., p. 3; Van Duzee, 1917, Cat. Hemipt. No. Amer., p. 21; Blatchley, 1926, Heteropt. East. No. Amer., p. 76.

Economic references:

1913. *Pangaeus bilineatus,* Swenk, Bul. State Entomologist, 1, p. 87 (attacking newly sprouted fall wheat and injuring plants).
1919. *Pangaeus bilineatus,* Watson, Fla. Bul. No. 151, p. 184. (Mentioned with *Corimelaena pulicaria* (Germ.). Discussion concerns *pulicaria.*)
1925. *Pangaeus bilineatus,* Ogilvie, Bermuda, Rept. Dept. Agriculture for 1925, p. 60. (Injury to strawberries - identity of species may be questioned since confusion with "Negro bugs" is obvious - may apply to a *Corimelaena.*)
1929. *Pangaeus bilineatus,* Watson, Fla. Dept. Agt. Quart. Bul., 39(3):126-127. (Treated with *Corimelaena pulicaria* (Germ.). Text appears to refer entirely to the latter species.)
1931. *Pangaeus uhleri,* Gould, Jour. Econ. Ent. 24:484-486. (Serious injury to spinach seedlings at Norfolk, Va.)
1931. *Pangaeus bilineatus,* Watson, Fla. Bul. No. 232, p. 91. (All information concerns *Corimelaena pulicaria* (Germ.).)
1932. [*Pangaeus bilineatus* according to Colcord, Index V, Amer. Econ. Ent.] Brooks, Watson and Mowry, Fla. Coop. Ext. Bul. No. 63, p. 51. (This species is referred to here as "Negro bugs or burrow bugs." The text clearly concerns a species of *Corimelaena.*)
1934. *Pangaeus uhleri,* Hyslop, Jour. Econ. Ent. 27:564. (Summarizes damage reported by Gould.)
1934. *Pangaeus bilineatus,* Russell, Bermuda Rept. Dept. Agriculture for 1933, pp. 35. ("Negro bug, *Pangaeus bilineatus",* punctured strawberries which subsequently rotted.)
1938. [Pangaeus bilineatus], Brooks and Watson, Fla. Coop. Ext. Agr. and Home Econ. 98:30. (Refers to "Burrow Bugs," but text concerns *Corimelaena* sp.)
1942. *Pangaeus bilineatus,* Watson and Tissot, Univ. Fla. Agr. Exp. Station, Bul. No. 370, pp. 97-98. (Discusses injury to strawberries and control.)

TWO NEW SPECIES OF MACHAERILAEMUS (Mallophaga, Menoponidae)

K. C. EMERSON
Oklahoma A. & M. College, Stillwater

Machaerilaemus maestum (Kellogg and Chapman 1899)

In the original description of *Machaerilaemus maestum* (Kellogg and Chapman 1899), the species was reported as being collected from *Zonotricha coronata* (Pallas), and *Melospiza melodia samuelis* (Baird). Since the recent publication of a discussion of the genus, question has arisen as to which bird is the host for this species.

Further examination of the material has shown that the type series contains two distinct forms. Since the holotype has not been designated, I designate the female which was labeled by Kellogg as being collected from *Zonotricha coronata* (Pallas), the Golden-crowned Sparrow.

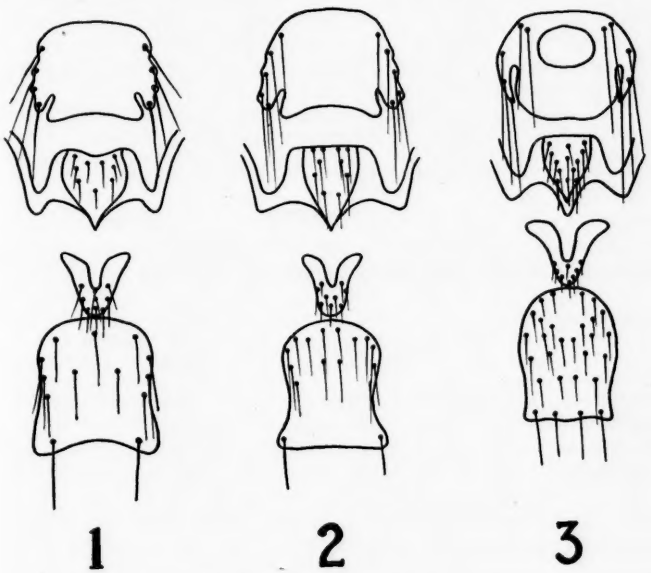
Machaerilaemus melospizae n. sp.

Female.—The head is more than twice as broad as long, with the cephalic margin broadly rounded. On the dorsal surface of the head is a V-shaped suture, present on several other species of the genus. The gular plate is entire, with posterolateral processes (fig. 1). The head is only lightly pigmented.

The prothorax is winged, with an interscapular bar not quite reaching the scapulars. Mesothorax with irregular concaved lateral margins. Metathorax, dorsally, resembling the abdominal segments. The thoracic sterna as shown in fig. 1. The coxae of the first pair of legs are elongate; the femora, stout and strongly arched; the tibia, long and tapering at the proximal ends.

The abdomen is short, oval-shaped, and lightly pigmented. Abdominal transverse bands present, but not heavily pigmented. Tergites with a posterior margin of ten medium length setae. Pleural plates with one long and four short setae. Three short spines present on the posterolateral angles of the sternites. Posterior margin of the abdomen and the vulva each with a row of short setae.

Type material.—Holotype, a female, in the Stanford University Natural History Museum, collected from *Melospiza melodia samuelis* (Baird), Samuel's Song Sparrow, in California.



EXPLANATION OF FIGURES

Gular region and thoracic sternal plates of *Machaerilaemus* species, female: 1, *melospizae* n. sp.; 2, *maestum* (Kellogg and Chapman); 3, *icterus* n. sp.

In my previous paper, figure 9 refers to *M. maestum* (K. and C.) as now defined; and figure 16, refers to *M. melospizae* n. sp. as described above.

Machaerilaemus icterus n. sp.

Female.—Head is more than twice as broad as long, with the cephalic margin evenly rounded. The dorsal surface of the head is without a V or Y-shaped suture, or it is so closely fused that all trace of it has been lost. The gular plate contains a conspicuous oval opening, and posterolateral processes (fig. 3). The head is not heavily pigmented, except for the narrow frontal and occipital bands, and the proximal margins of the antennal fossae. Dorsally, one long setae just anterior to each antennal fossa; and two long setae on each temple.

The prothorax is winged, with an interscapular bar not quite reaching the long scapulars. Ten long setae, evenly spaced, on the posterior margin of the prothorax. Mesothorax triangular in shape; dorsally, with fourteen long setae on the posterior margin. Metathorax, dorsally, resembling the abdominal segments. The thoracic sterna as shown in figure 3. The coxae of all legs elongate; the femora, stout and strongly arched; the tibae, long and tapering at the proximal ends.

The abdomen, widest at the fourth and fifth segments, is lightly pigmented, and oval-shaped. Tergites with a posterior margin of fourteen medium length setae. Pleural plates with two long and six short setae. Two short stout spines present on the posterolateral angles of the sternites. Posterior margin of the abdomen and the vulva each with a row of short setae.

Type material.—Holotype, a female, in my personal collection, collected by Dr. Richard E. Tashian; from *Icterus sclateri alticola* Miller and Griscom, Guatemala Oriole, near Uzumatlan, Department of Zacapa, Guatemala.

DISCUSSION

These forms can best be separated by a comparison of the gular plates which are illustrated. Measurements for the two new forms are as follows:

	M. melospizae n. sp.		*M. icterus* n. sp.	
	Length	Width	Length	Width
Head	.23mm	.55mm	.24mm	.58mm
Prothorax	.16	.37	.18	.40
Mesothorax	.07	.46	.16	.52
Metathorax	.08	.53	.05	.58
Total	1.12		1.22	

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Kellogg, V. L. and Chapman, B. L. 1899. Mallophaga from birds of California. Occ. Papers Calif. Acad. Sci., 6:53-143.

TWO NEW CHIGGER MITES (GENUS *TROMBICULA*) FROM THE CENTRAL UNITED STATES[1] [2]

RICHARD B. LOOMIS AND LOUIS J. LIPOVSKY

In a chigger mite survey of Barber County in south-central Kansas and adjacent Woods County, Oklahoma, two closely related, but distinct, species of the genus *Trombicula* were found. One of these species was found only on Mexican free-tailed bats, *Tadarida mexicana,* taken in Oklahoma, while the other species was taken on terrestrial mammals in the canyon area of Barber County, Kansas. These undescribed species may be representatives of a new subgenus of *Trombicula, sensu lato,* but we feel that it is premature to consider them separate from other species and subgenera without more critical study of additional described larvae and without using the characters of the postlarval stages.

The only described species that seems to be closely related to these two species is *Trombicula cynictia* Radford, 1942, from Hoopstad, Orange Free State, South Africa. The similarity may be superficial, however, since there are many differences. Examination of two topotypes of *T. cynictia* (KU slide no. 3516) reveals that the chelicera is large (25μ from tip to posterior curve), with a prominent dorsal tricuspid cap present. The papal claw is bifurcate, but the prongs are short, approximately equal in size and length, and with the inner axial prong only slightly curved inward. On the legs there is a pretarsala II, three genualae I and the number of branches on the leg setae is only slightly reduced on the distal segments. In addition the body does not extend over the gnathosoma in engorged larvae and the body setae have many barbs or branches with the exception of the sternal and anterior ventral setae. These and other differences seem to indicate that the relationship is not extremely close.

The new species are described below. The terminology used throughout this paper is that of Wharton, *et al,* 1951. The measurements are in microns. The descriptions are based upon the holotypes, with differences among the paratypes noted in parentheses.

Trombicula ornata[3] new species

Figures 1-4, 7-9

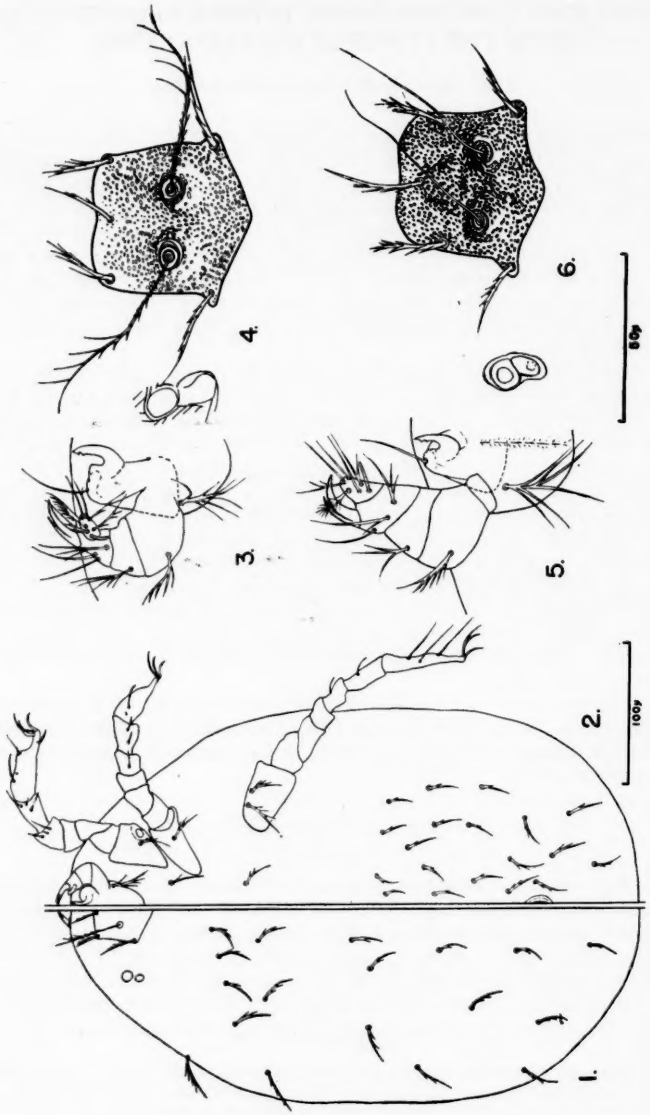
Types.—Larvae: Holotype, slide no. 3401 (laboratory reared) and 39 paratypes, nos. 3402-3440, Snow Entomological Museum, University of Kansas, from 4 miles south of Aetna, Barber County, Kansas, taken from 17 gray wood rats, *Neotoma micropus* Baird, field numbers RL490411-1; 13-1; 14-1, trapped on April 11-14, 1949, by the authors and Mr. Keith A. Wolfenbarger.

Diagnosis:—Larva: Cheliceral blade small, with a sharp terminal point; palpal claw bifurcate, with a deep cleft between small outer and large inner

[1]The studies upon which this paper is based were conducted under a contract, N6 ori 220 Task Order 2, between the University of Kansas and the Office of Naval Research.

[2]Contribution No. 866 of the Department of Entomology, University of Kansas.

[3] Named for the ornate, sculptured scutum.


1.
2.
100μ
3.
4.
5.
6.
50μ

axial prongs; the body extending over the gnathosoma in the fully engorged larva; scutum roughly square, sculptured with large pits; the sensilla flagelliform with several long, slender branches on distal half; palpal tibia with one ventral branched seta and two nude setae; galeal seta nude; coxa III with two setae; and with three mastitarsalae III. Closely related to *Trombicula merrihewi* n. sp.

Description of larva.—Body: Holotype (unengorged), 204 by 163 (engorged, 408 by 297, with anterior part of body over gnathosoma in engorged larvae); color in life, orange. Eyes 2/2, red in life, length of both on one side, 22, width 12; subequal; ocular plate obscure.

Dorsal setal formula 2-9-4-8-6-4-4, total 37 (first row 8 to 9, total dorsal setae 36 to 38); humeral seta measures 50, anterior dorsal seta 29, posterior dorsal seta 31. Ventral setal formula 2-2 and approximately 40, total 44; anterior sternal seta measures 33, posterior sternal seta 26, anterior ventral seta 18, posterior ventral seta 29. Total body setae approximately 80.

Scutum: Shape roughly square, with the posterior margin slightly angular with large pits over entire scutum; scutal setae short with few branches, AM and AL approximately the same length, and shorter than PL; all scutal setae near margins. Sensillary bases situated nearly equidistant between the anterior and posterior margins, and nearly in line with the mid-points between the AL's and PL's. Sensilla flagelliform, with three long branches (3-5) on distal half and several barbs on proximal half. Scutal measurements of holotype: AW—35, PW—46, SB—19, ASB—24, PSB—24, AP—31, AM—28, AL—22, PL—37, S—64. Average and extremes of four types: AW—35 (34-36), PW—48 (46-51), SB—21 (19-22), ASB—24 (22-24) PSB—25 (24-27), AP—31 (31-32), AM—29 (28-30), AL—23 (19-26), PL—37 (34-45), S—66 (64-67).

Gnathosoma: Cheliceral blade short, 22μ from tip to posterior angle, slender, with sharp pointed tip, small dorsal tricuspid cap, with a groove and tooth behind cap. Galeal seta nude. Capitular sternum faintly punctate with one pair of branched setae. Palpal femur and genu each with one branched seta; tibia with branched ventral seta and two nude setae; tarsus with a basal spur (7μ), one stout plumose seta, four branched setae, and terminal seta nude (or with one branch). Palpal claw bifurcate, with a large stout inner axial prong curving inward and a small outer prong, cleft between the prongs deep.

Legs: Leg I coxa, trochanter and basifemur each with one branched seta; telofemur with five branched setae; genu with four branched setae, two genualae and a microgenuala; tibia with six branched setae, two tibialae and a microtibiala; tarsus with approximately 14 branched setae, a long slender spur (23μ), microspur, subterminala, a parasubterminala and a pretarsala. Leg II

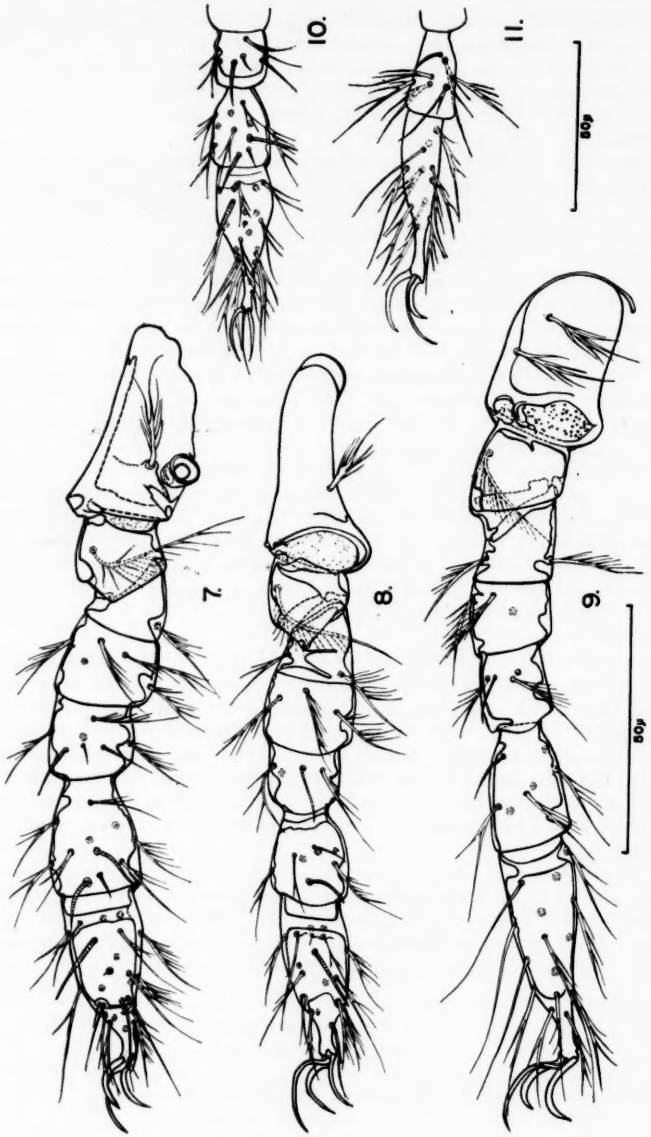
EXPLANATION OF PLATE I

Trombicula ornata new species

Fig. 1. Dorsal aspect of body. Fig. 2. Ventral aspect, showing nude setae on the legs. Fig. 3. Ventral aspect of the gnathosoma. Fig. 4. Scutum and eyes.

Trombicula merrihewi new species

Fig. 5. Ventral aspect of the gnathosoma, Fig. 6. Scutum and eyes.


10.
11.
80μ
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8.
9.
80μ

coxa and trochanter each with one branched seta; basifemur with two branched setae; telofemur with three branched setae; genu with three branched setae and a genuala; tibia with six branched setae and two tibialae; tarsus with approximately 17 branched setae, a spur (16μ), and a microspur (no pretarsala). Leg III coxa with two (occasionally three on one side) branched setae; trochanter with one branched seta; basifemur with two branched setae; telofemur with three branched setae; genu with three branched setae and a genuala; tibia with six branched setae and a tibiala; tarsus with approximately 11 branched setae and three mastitarsalae. All leg segments with scattered punctae. The branched setae of the three distal segments of all legs have a reduced number of branches (see figures 7-9).

Remarks.—*Trombicula ornata* was found on hosts inhabiting the gypsum canyon area in Kansas. The larvae were found in the ears and on the body of the host. They seem to be most abundant in the spring, but they were found on hosts from April to October.

This species was cultured by one of us (Lipvosky) and second generation larvae were obtained, including the holotype and several paratypes.

Specimens examined.—Total, 70 larvae, as follows. KANSAS. *Barber County:* 4 mi. S Aetna, *Neotoma micropus,* April 11-14, 1949, KU slides 3401-3449, August 22, 1949, KU 3465-67 *-Peromyscus leucopus,* April 13, 1949, KU 3457-61, July 25-26, 1952, KU 3468-69; 5 mi. S Sun City, *Neotoma micropus,* Sept. 14, 1948, KU 3462-64, April 12, 1949, KU 3450 *-Peromyscus maniculatus,* April 12, 1949, KU 3451-56. COLORADO. *Boulder County:* Gregory Canyon, Boulder City Park, *Peromyscus maniculatus,* August 14, 1947, KU 3470.

Trombicula merrihewi[4] new species

Figures 5-6, 10-11

Types.—Larvae: Holotype, slide no. 3472 and 40 paratypes, nos. 3473-3512, Snow Entomological Museum, University of Kansas, from the Merrihew Cave, 6 miles south and 2 miles west of Aetna, Kansas, in Woods County, Oklahoma, recovered from several hundred Mexican free-tailed bats, *Tadarida mexicana* (Saussure), field number RL490824-2, obtained on August 24, 1948, by David T. Clark, Robert E. Elbel and Richard B. Loomis.

Diagnosis.—Larva: Closely related to *Trombicula ornata* n.sp. in having a small cheliceral blade, a bifurcate palpal claw with a deep cleft between the smaller outer and the larger inner axial prongs; the body extending over the gnathosoma in the fully engorged larva; the scutum roughly square, sculptured with large pits; and the galeal seta nude. *Trombicula merrihewi* differs in having a nude flagelliform sensilla; one nude and two branched setae on the palpal tibia; a large projecting palpal tarsus, with different types of setae; coxa III with one branched seta and one mastitarsala III.

[4] Named for Mr. D. F. Merrihew, owner of the Merrihew Cave (type locality) who extended us many courtesies.

EXPLANATION OF PLATE II

Trombicula ornata new species

Fig. 7. Leg I. Fig. 8. Leg II. Fig. 9. Leg III.

Trombicula merrihewi new species

Fig. 10. Distal segments of Leg I. Fig. 11. Distal segments of Leg III.

Description of larva. —Body: Holotype (engorged), 571 by 360 (anterior part of body over gnathosoma in engorged larvae); pale yellow in life. Eyes, 2/2, red in life, poorly defined with anterior slightly larger, length of both on one side, 15, width 8, ocular plate obscure.

Dorsal setal formula 2-8-4-4-2-4-6-4-2, total 36; humeral seta measures 44, anterior dorsal seta 22, posterior dorsal seta 21. Ventral setal formula 2-2 plus, 34, total 38 (36-38); anterior sternal seta measures 28, posterior sternal seta 23, anterior ventral seta 18, posterior ventral seta 22. Total body setae approximately 74.

Scutum: Shape roughly square, posterior margin slightly angular, posterior corners flared; anterior margin, rounded; sculptured over entire area by large prominent pits; anterolateral and posterolateral setae approximately equal in length, anteromedian seta slightly longer; AM and AL bases not at edge of scutum; sensillary bases nearly in line with the mid-points between the AL's and PL's; sensilla flagelliform, nude. Scutal measurements of holotype: AW—40, PW—51, SB—24, ASB—28, PSB—21, AP—24, AM—24, AL—17, PL—18, S—46. Average and extremes of five types: AW—35 (33-40), PW—43 (36-51), SB—19 (16-24), ASB—27 (26-28), PSB—19 (17-21), AP—24 (22-26), AM—23 (22-24), AL—16.5 (16-17), PL—20 (18-22), S—43 (40-46).

Gnathosoma: Cheliceral blade extremely short, 14μ from tip to posterior curve, with pointed tip, and two ridges on dorsal side, tricuspid cap if present is obscure. Galeal seta nude. Capitular sternum faintly punctuate, with one pair of branched setae. Palpal femur and genu each with one branched seta; tibia with two branched setae and one nude seta; tarsus with a spur (9μ), one stout plumose seta and five setae, with three of these nude and two with only one or two branches. Palpal claw bifurcate, with a deep cleft, and a large inner axial prong curving inward.

Legs: All segments with punctae, strong on coxae, reduced and faint on distal segments. Setae on all legs similar to *T. ornata* except for the following: Leg I tarsus with a short stout spur (12μ); leg II tarsus with a short stout spur (11μ); leg III coxa with one seta, and tarsus with approximately eleven branched setae and one mastitarsala. See figures 10 and 11 for details of the tibia and tarsus of legs I and III.

Remarks.—Trombicula ornata and *T. merrihewi* seem to be closely related; but the resemblances may merely indicate parallelism as there are several differences. The species *T. ornata* seems to be more closely related to other species now referred to the genus *Trombicula, sensu lato,* while *T. merrihewi* differs markedly in the relatively large size of the palpus, the position, size and setation of the palpal thumb; and the relatively small cheliceral blade with the sharp terminal point lacking a tricuspid cap. The leg setation as well as other characters are similar which seems to indicate a close relationship. The other differences may represent specializations in the the bat chigger *T. merrihewi.*

Trombicula merrihewi was taken from the ears of *Tadarida mexicana,* in association with *Speleocola tadaridae* Lipovsky, 1952, both chigger mites being known only from this species of bat. Numerous individuals of several other kinds of bats from the Merrihew Cave and neighboring caves in Kan-

sas and many species and individuals of local terrestrial mammals were also checked without obtaining larvae of these two bat chiggers.

This species has been reared by one of us (Lipovsky) to the adult stage.

Specimens examined.—Total, 43 larvae, as follows. OKLAHOMA. *Woods County:* 6 mi. S, 2 mi. W Aetna, Kansas, *Tadarida mexicana,* Sept. 15, 1948, KU 3471, Aug. 24, 1949, KU 3472-3512 (type series), Oct. 6, 1951, KU 3514.

Distribution of paratypes.—Paratypes of both species will be deposited in the following collections: United States National Museum; Rocky Mountain Laboratory; British Museum (Natural History); The South Australian Museum, Adelaide; Dr. George W. Wharton; Dr. Charles D. Radford; the Museum National d'Histoire Naturelle, Paris, France; the Army Medical Service Graduate School, Washington, D.C., and Dr. J. R. Audy, Institute for Medical Research, Kuala Lumpur, Malaya.

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THREE NEW SPECIES OF NEARCTIC *CONOPHORUS* (Diptera, Bombyliidae)[1]

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The present paper represents the first results of a study of the genus *Conophorus* in North America, which will be continued in a later and more comprehensive paper now in preparation.[2]

Conophorus chinooki new species

Male.—Ground color grayish black, partly brownish on dorsum of thorax and abdomen, opaque. Middle of occiput with yellowish white pile and scattered long black hairs; lower lateral portions of occiput with dense intermixed black and yellowish pile. Ocellar triangle black pilose. Upper part of face intermixed white and black pilose; lower part of face white pilose. First and second antennal segments with long black pile, and with shorter yellowish

[1]Contribution No. 8, Pymatuning Laboratory of Field Biology.

[2] The author is indebted to the following individuals and institutions that have generously lent collections represented in the present paper: American Museum of Natural History, C. H. Curran, Canadian National Collections, G. E. Shewell, Carnegie Museum (Pittsburgh), Kansas State College, R. H. Painter, Oregon State College, Paul O. Ritcher, United States National Museum, Willis W. Wirth, State College of Washington, Maurice T. James. Dr. George E. Wallace and staff of the Division of Entomology of the Carnegie Museum have not stinted in their time and cooperation.

pile which is more abundant on the medial and lower surfaces. First antennal segment elongated, about equal in length to the remainder of the antenna; second antennal segment subcylindrical, about twice as long as broad; second and third antennal segments subequal. Mesonotum and scutellum with long black hairs and sparse short yellowish tomentum; interspersed black and white pile anterior to base of wing. Apex of scutellum shining black. Wings dark brown at the base and along the anterior margin, gradually fading toward the posterior margin, but darker along the veins. Three submarginal cells. Hairs of alulae yellowish. Knob of halteres black, the stalk brownish yellow. Metapleura with tuft of white hair just anterior to base of halter and ventral to alula. Femora with white hairs proximally and black hairs distally. Tibial spines black. Coxae white pilose. Dorsum of abdomen with yellowish tomentum and long black hairs on all segments. Lateral margin of abdomen with fringe of short white pile, intermixed with scattered longer black hairs. Venter white pilose, with a few black hairs on the posterior half. Length of body 8 mm.; of wing 7 mm.

Female.—Similar to male; front with black hairs and sparse short yellowish pile and tomentum.

Holotype.—Male, Chinook Pass, Washington, August 1, 1932. Carnegie Museum.

Allotype.—Female, Moscow, Idaho, June 6, 1912 (J. M. Aldrich). United State National Museum.

Paratypes.—One male, Moscow Mt., Idaho, June 1, 1907 (J. M. Aldrich), two males, summit Mt. Moscow, Idaho, June 5, 1930 (J. M. Aldrich), United States National Museum; one male, Chinook Pass, Washington, August 1, 1932, Carnegie Museum; one male, Antelope Mt. (6500 ft. elevation), Harney Co., Oregon, July 3, 1931 (D. K. Frewing), Oregon State College.

This species is near *C. sackenii* Johnson and Maughan (Great Basin Naturalist 13 (1/2):22-26, 1953), from which it may be readily distinguished by the shining black scutellum. In this character *chinooki* resembles *atratulus*, from which, however, it differs in having the metapleural tuft of hairs just anterior to the halter base and the elongated first antennal segment. (Although *atratulus* usually has yellow halter knobs, an occasional specimen has black knobs like *chinooki*). One female from Chinook Pass, Washington, in the Carnegie Museum, is not designated as typical because of abnormal wing venation, but in other characters resembles the types.

Conophorus columbiensis new species

Male.—Ground color grayish black, brownish on dorsum of thorax and abdomen. Occiput with intermixed black and white pile; lower lateral portions of occiput with a dense tuft of short black pile, with yellowish pile intermixed. Ocellar triangle with black hairs. Upper part of face black pilose, lower part of face intermixed white and black pilose. First and second antennal segments with black hairs, most of them forming a dense, long tuft ventrally; short appressed yellowish hairs on the medial aspect of the first antennal segment. First antennal segment elongated, about equal in length to the remainder of the antenna; second antennal segment short, about one and one-half times as long as broad; third antennal segment nearly twice as

long as the second, flattened, broadest near the middle, tapering distally, much thicker at its distal end than the first joint of the style. Mesonotum and scutellum with long black pile and sparse short white tomentum; dense pile of yellowish, fulvous, and a few black hairs anterior to base of wing. Apex of scutellum shining black. Wings infuscated at the base and along the anterior margin, gradually fading toward the posterior margin, but darker along most of the veins. Three submarginal cells. Hairs of alulae yellowish. Knob of halteres black, the stalk brownish yellow. Metapleura with tuft of white hair just anterior to base of halter. Femora with white pile proximally and black pile distally. Tibial spines black, stout on middle and hind tibiae, small on anterior tibiae. Coxae white pilose. Dorsum of abdomen with black hairs, most of which are in transverse rows near the posterior margin of each segment, and short white tomentum. First abdominal segment with dense white pile at anterolateral margins; second abdominal segment with short fringe of white pile; lateral margin of remaining segments of abdomen with sparse long black and short white pile. Venter white pilose, with scattered black hairs on segments five, six and seven. Length of body, 6 mm.; of wing, 5 mm.

Female.—Similar to male; front with long black and short yellowish pile.

Holotype.—Male, Nicola Lake, British Columbia, June 10, 1922 (E. R. Buckell). Canadian National Collections.

Allotype.—Female, Nicola Lake, British Columbia, May 29, 1922 (E. R. Buckell). Canadian National Collections.

Paratypes.—One male, Vernon, British Columbia, May 24, 1918, Canadian National Collections; one male, Pullman, Washington, May 7, 1948 (C. Sanderman), State College of Washington; one female, Nicola Lake, British Columbia, May 29, 1922, Canadian National Collections; one female, Missoula, Montana, May 17, 1941 (L. J. Lipovsky), State College of Washington. One male and three females from Victoria, British Columbia, and one male from Nicola, British Columbia, have also been seen. This species is named for the province of British Columbia.

This species is near *chinooki,* from which it is distinguished by having the second antennal segment much shorter than the third, by the scarcity or absence of yellowish hairs on the antennae, by the weaker spines on the anterior tibiae, and by smaller size of all but one of the individuals seen. *C. columbiensis* also resembles *atratulus,* from which it can be separated easily by the presence of the metapleural tuft of hairs, the elongated first antennal segment, and from typical specimens of *atratulus* by the black halter knobs. Although *columbiensis* is in some respects intermediate between *chinooki* and *atratulus,* the metapleural hairs, elongated first antennal segment and other similarities indicate that *columbiensis* belongs with *chinooki* and *sackenii* in a closely allied group of three species which should probably be regarded as a distinct subgenus. Except for these three species all known North American *Conophorus* have the metapleura bare.

Conophorus auratus new species

Male.—Ground color grayish black, entirely opaque; pile predominantly yellow. Head yellow pilose, with some black hairs on occiput and upper part

of face at the sides; ocellar triangle yellow pilose. First and second antennal segments with long black and yellow pile, some of the yellow pile forming a dense tuft on the ventral surface. First antennal segment greatly thickened, comprising about four-tenths of the total length of the antenna; second antennal segment stout, about one and one-half times as long as wide; third antennal segment about twice as long as the second, slender, flattened and tapering distally. Medial part of mesonotum yellow pilose; lateral parts with black and yellow pile interspersed. Scutellum yellow pilose, opaque. Wings dark brown at the base and along the anterior margin, gradually fading toward the posterior margin, but darker along the cross veins at the apices of the two basal cells. Three submarginal cells. Costa strongly serrate. Hairs of alulae yellowish. Knob of halteres yellow, infuscated below, the stalk brownish yellow. Metapleura bare. Hairs of coxae and anterior femora yellowish; hairs of middle and posterior femora yellowish and black intermixed. Tibial spines stout, black. Dorsum of abdomen with yellow pile and tomentum; lateral margin of abdomen with dense fringe of yellow pile, interspersed with black pile on the posterior half; venter yellow pilose on first five segments, yellow pilose with a few black hairs posteriorly. Length of body 10 mm.; of wing 8 mm.

Female.—Similar to male; medial part of occiput with yellow pile; front with long black and short yellow pile. Costa not serrate.

Holotype.—Male, east side of Yellowstone National Park, Wyoming, October, 1894 (J. B. Lembert). United States National Museum.

Allotype.—Female, same data. United States National Museum.

Paratypes.—One male, same data, United States National Museum; one male, Crater Lake Park, Oregon, South Entrance, 4800 feet elevation, August 25, 1930 (H. A. Scullen). R. H. Painter, Kansas State College.

Only these four individuals have been seen. The paratypes have few black hairs on the posterior part of the abdomen but are otherwise similar. This species is near *cristatus,* from which it may be easily distinguished by its general yellow pilosity. It is larger than *serratus* and *melanoceratus,* from which it is also distinguished by its dense, long yellow tuft of pile on the ventral aspect of the antennae. From all three species it is distinguished by the presence of only yellow hair on the ocellar triangle. Comparison of the wings with the type of *limbatus* in the Museum of Comparative Zoology indicates that the latter species has six sharply defined dark areas, mostly along the anterior margin and the cross-veins, and is in this regard distinct from *auratus,* which has only two ill-defined clouds on the cross-veins at the apices of the basal cells. The type of *limbatus* is headless; a metatype (compared by C. H. Curran, in the American Museum of Natural History collection) shows a few black hairs interspersed with yellow ones on the ocellar triangle, whereas in *auratus* no black hairs are present here.

NEW SPECIES OF WESTERN TRICHOPTERA

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During the past few years several very interesting new caddis flies have been collected in Western United States. A few of these are described in this paper, together with the descriptions of a new genus in the Limnephilidae and one new genus in the Odontoceridae. Unless designated otherwise, types of the new species are in the author's collection. I would like to thank Mr. Vincent Roth, Mr. Stanley Jewett, Mr. Harry Chandler, Mr. Borys Malkin and Dr. C. P. Alexander for sending me material used in this paper.

Rhyacophila celina n. sp.

This species may be easily identified on the basis of the male genitalia, which are remarkably different from other described species. In *celina* the claspers are very short, the basal and apical segment are about the same size and the tenth tergite is long, reaching slightly beyond the claspers.

Male.—Length 11 mm. Head blackish, antennae and legs testaceous. Wings light brown, irrorate with scattering of light spots. General structure typical for genus. Sixth and seventh sternites with a small mesal tooth.

Genitalia as in fig 1. Ninth segment annular, narrow, only slightly indented to receive claspers. Tenth tergite represented as a heavily sclerotized, complicated structure; divided at base into a pair of small triangular lobes, seen dorsally as in fig. 1a, remainder of structure consists of two lateral lobes fused dorsally; apical margin widely emarginate, fig. 1b; caudad to this is a pair of heavily sclerotized apically truncate structures, divided entire length, ventrad to above structure is a small caudally directed structure, abruptly narrowed distally, ventral aspect, fig. 1c, bifid, apices convergent. Clasper very short, both segments about equal length; basal segment rhomboidal, apical segment thick, ovoid, baso-ventral portion produced mesad, fig. 1d, entire mesal surface covered with dense short black setae. Aedeagus retracted into eighth and ninth segments, structure difficult to distinguish; ventral portion rod-like, attenuate, apex acute and extending beyond remainder, dorsal portion plate-like, apical margin sinuous.

Holotype, male.—Philomath, Benton Co., Oregon, 6.5 miles S.W. along Hyde Creek, April 13, 1951, R. E. Noble.

Paratype, male.—Boulder Lake Trail, Olympic National Park, Washington, July 21, 1953, K. M. Fender

Rhyacophila jewetti n. sp.

The tenth tergite suggests a relationship to *vaefes* Milne and *vujuna* Milne. However, the apical segment of the clasper and the aedeagus are very different and will easily distinguish this species.

Male.—Length 10-11 mm. Color of wings uniformly fuscous, head, thorax and abdomen a trifle darker, legs yellowish, spurs dark brown. A minute mesal tooth present on sternum of seventh segment.

Genitalia as in fig. 2. Ninth segment annular, lateral portion a trifle wider than dorsum which projects over tenth tergite a short distance as a triangular lobe when seen from dorsal aspect. Tenth tergite consists of a pair of lateral sclerites, rounded dorsally and rather abruptly turned dorsad, bearing short setae marginally, seen from dorsal aspect as in fig. 2a; from lateral aspect apical margin sinuate and heavily sclerotized, from meson arises a single sclerotized reticulated plate projecting directly caudad, apex truncate, ventro-apical corner arcuate. Apical segment of clasper narrowed distally, directed slightly ventral, dorsal margin with brush of dense stout reddish-brown setae. Aedeagus consists of a wide sclerotized plate-like structure, dorsal structure apically furcate, bearing a stout acute spine on each side near apex, viewed dorsally fig. 2b, ventral portion furcate apically, viewed ventrally fig. 2c, a single slender acute spine arises from near apex, best seen from lateral aspect; lateral arms heavily sclerotized, practically same width throughout, truncate from lateral aspect acute and convergent from ventral or dorsal aspect, fig. 2d, extending beyond remainder of structure.

Holotype, male.—Ollalie Creek Camp, McKenzie River, Lane Co., Oregon, July 15, 1952, S. G. Jewett, Jr.

Paratypes.—Same data as holotype, 9 males.

It is with pleasure that I name this species in honor of Stanley Jewett who collected this species and who through his ardent collecting has obtained many interesting species and records of Trichoptera.

Rhyacophila velora n. sp.

This is a small species—one of the smallest described—bearing little resemblance to other described species. On the basis of the genitalia, especially the peculiar tenth tergite, it can easily be recognized.

Male.—Length 6-7 mm. Wings uniformly blackish, legs yellowish, antennae and palpi dark brown. Head, thorax and abdomen dark brown. Seventh sternite with rather prominent mesal tooth.

Genitalia as in fig. 3. Ninth segment annular, considerably widened dorsally, dorsum higher than tenth tergite, apically declivous, viewed dorsally, fig. 3a, broadly arcuate. Tenth tergite small, from dorsal aspect, fig. 3a, flattened and expanded laterally, apical portion bifid, each apex acute and divergent; viewed from lateral aspect apex short and blunt, ventral process finger-like, slender, blunt and directed ventrad. Clasper with basal segment gradually widened distally, apical segment directed ventro-caudad, apico-ventral corner rounded; setation sparse. Aedeagus retracted into eighth and ninth segments, structure difficult to discern; lateral extensile arms membranous, expanded distally into ovoid plates, mesal surface covered with dense short reddish-brown setae, fig. 3b.

Female.—Length 6-7 mm. Size, color and general structure essentially similar to male. Sixth sternite bearing a small mesal tooth. Eighth segment with sternite extended caudally, broadly arcuate.

Holotype, male.—Burney Falls State Park, Shasta Co., California, July 27, 1952, D. G. Denning.

Allotype, female.—Same data as for holotype.

Paratypes.—Same data as for holotype, 16 males, 8 females; Burney Falls, Shasta Co., California, June 29, 1947, H. P. Chandler, 1 male; Burney Falls, Shasta Co., California, Sept. 17, 1946, H. P. Chandler, 6 males.

Paratypes collected by H. P. Chandler returned, and are located in his collection.

Glossosoma bruna n. sp.

This species is related to the *traviatum, excita, schuhi* group in which a large spine-like process arises from near base of cercus. The tenth tergite and aedeagus is very similar to *schuhi* but the claspers bear most resemblance to *excita.* The species may be distinguished from others in the genus by the prominent claspers which taper to an acute upturned apex.

Male.—Length 8-9 mm. Color brownish, wings faintly irrorate near apex and margin, head, thorax, dark brown, legs yellowish and spurs black. Fifth sternite with small auriculate lobes, sixth sternite with very large flat rounded apico-mesal process, seventh sternite with small mesal tooth.

Genitalia as in fig. 4. Ninth segment hood-like, lateral margins produced into thin flaps which completely cover tenth tergite. Tenth tergite consists of pair of lateral lobes separated by membranous sheath and produced distally into an acute point. Cercus short, digitate from lateral view, broad from ventral view, lightly sclerotized, fig. 4a. Near base of cercus arises a large filiform process projecting nearly to lateral margin of hood, broadly curved mesad when seen from ventral aspects, fig. 4b. Claspers prominent, heavily sclerotized; base broad, dorsal and ventral margin sinuate, tapering abruptly about two-thirds from base to an acute dorsad curved apex. Arising from base of claspers and projecting caudo-ventrad between claspers is a short, wide, emarginate flap. Aedeagus broadly arcuate, as heavily sclerotized as claspers, bifid nearly to base, between lateral portions a membranous fold; viewed from lateral aspect structure tapers to an acute apex, extends ventro-caudad nearly to apex of claspers.

Female.—Length 9 mm. General color and structure similar to male. Eighth segment annular, dorsal margin with short incision, lateral margin sinuate and ventral margin with a broad, deep truncate incision.

Holotype, male.—Hat Creek, at Hwy. 299, Shasta Co., California, May 7, 1952, D. G. Denning.

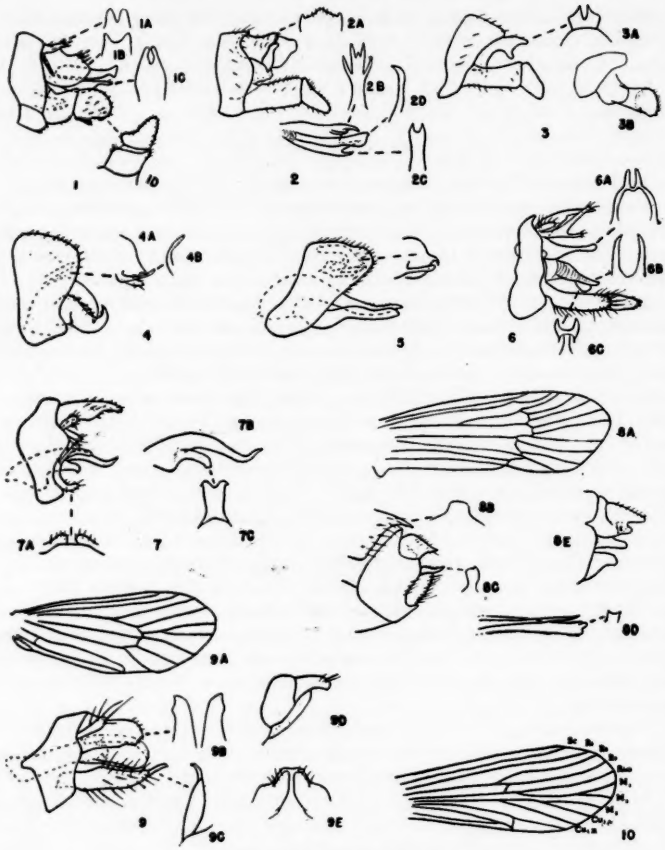
Allotype, female.—Same data as holotype.

Paratypes.—Same data as holotype, 6 males, 4 females; Crystle Lake, Shasta Co., California, May 27, 1949, H. P. Chandler, 1 male; Redding, Shasta Co., California, May 8, 1947, H. P. Chandler, 3 males.

Paratypes collected by H. P. Chandler returned, and are located in his collection.

Glossosoma oregonense Ling

This is a poorly known species which occurs throughout Oregon, Northern California and Western Nevada. Collection dates are in June, July and September. The species belongs to the *traviatum, schuhi* group and is most closely related to *schuhi.* The male genitalia, fig. 5, are drawn from a specimen collected at Strawberry, Tuolumne Co., California, July 13, 1951, A. T.



EXPLANATION OF PLATE

Figs. 1-10.—1. *Rhyacophila celina,* lateral aspect; 1A, 1B, 1C, tenth tergite, dorsal aspect 1D, clasper, ventral aspect. 2. *Rhyacophila jewetti,* lateral aspect; 2A, tenth tergite, dorsal aspect; 2B, 2C, 2D, dorsal and ventral aspect of aedeagus. 3. *Rhyacophila velora,* lateral aspect; 3A, tenth tergite, dorsal aspect; 3B, aedeagus. 4. *Glossosoma bruna,* lateral aspect; 4A, tenth tergite, lateral aspect; 4B, filiform process, ventral aspect. 5. *Glossosoma oregonense,* lateral aspect. 6. *Radema chasica,* lateral aspect; 6A, ventral portion of tenth tergite, dorsal aspect; 6B, dorsal process of aedeagus, dorsal aspect; 6C, ventral process of aedeagus, ventral aspect. 7. *Cryptochia neosa,* lateral aspect; 7A, claspers, ventral aspect; 7B, aedeagus, lateral aspect; 7C, ventral process of aedeagus, ventral aspect. 8. *Desmona bethula,* lateral aspect; 8A, forewing; 8B, eighth tergite, dorsal aspect; 8C, apex of clasper, dorsal aspect; 8D, aedeagus; 8E, female genitalia, lateral aspect. 9. *Parthina linea,* lateral aspect; 9A, forewing; 9B, tenth tergite, dorsal aspect; 9C, clasper, ventral aspect; 9D, female genitalia, lateral aspect; 9E, female genitalia, dorsal aspect. 10. *Molannodes bergi,* forewing.

McClay, which was compared and found identical to the Holotype collected at Crater Lake, Oregon, July 18, 1922, Van Dyke and deposited in the California Academy of Science Collection, San Francisco, California.

Radema chasica n. sp.

This species belongs to the *sorex, comosa* group and is most closely related to *sorex*. It can be separated from those species by the long slender basal and apical segment of the clasper, and several other differences in the genitalia.

Male.—Length 9 mm. Head and thorax dark brown, antennae and wings brown, portions of femora, tibia and tarsus fuscous and yellowish. Spurs 1-2-4.

Genitalia as in fig. 6. Dorsum of ninth segment reduced, sternum considerably expanded; arising from dorsum and projecting cephalad is a thin flaplike fold. Tenth tergite, viewed laterally, composed of following structures: (1) a dorsal process with base wide, distal portion abruptly narrowed, acuminate, (2) a pair of lateral bilobed processes, dorsal arm long, slender throughout, (3) a ventral pair of heavily sclerotized processes, narrowed distally to a clavate apex, reaching as far caudad as most dorsal process; viewed from dorsal aspect process most dorsad (1) appear as a single structure, narrow throughout and bearing a few small, fine laterad directed setae, ventral processes (3) connected on meson by membranous sheath, apices separated and directed caudad, fig. 6a. Cerci short, stocky. Clasper with basal segment almost cylindrical, basal attachment constricted, distally bears a considerable number of long stout setae; apical segment relatively short, apically narrowed to sub-acute apex, lateral surface rounded, mesal surface flattened, apex covered with dense mass of stout blackish setae. Dorsal process of aedeagus consists of a pair of sclerotized blades arising from membranous sheath, seen dorsally, fig. 6b, apices acute and directed caudad; ventral process a heavily sclerotized lobe, directed ventro-caudad, from ventral aspect, fig. 6c, widely furcate.

Holotype, Male.—West Gallatin River, about 30 miles south of Bozeman, Montana, May 17, 1952, Stanley G. Jewett, Jr.

Cryptochia neosa n. sp.

This, the third species in the genus, may be distinguished from *pilosa* and *furcata* on the basis of the ventral portion of the aedeagus. In *pilosa* it is massive and boot-like, in *furcata* it is as long as the dorsal pair of blades and the apex is hamate, in *neosa* it is half the length of the dorsal blades and the apex is truncate.

Male.—Length 8 mm. Head and thorax dark brown, fore and hind wing blackish with a scattering of small clear spots, legs luteus.

Genitalia as in fig. 7. Ninth segment with tergum and sternum considerably narrowed, lateral portion expanded. Tenth tergite cleft almost to base, from lateral aspect ventral margin sinuate, apical third abruptly narrowed, apex obtuse. Cerci leaf-like, lightly sclerotized, setae fairly abundant. A pair of lobes located laterally between clasper and tenth tergite consist of: (1) a prominent filiform process, narrowed from a broad base to a blunt slender lobe and (2) a dorsal elongate slender process, apex bearing a few setae and directed only slightly ventrad. Clasper elongate, appressed to ninth segment

entire length except apex which is slightly curved dorsad, viewed from ventral aspect, fig. 7a, somewhat ovoid; dorsally claspers bears a short, blunt filamentous process. Aedeagus, fig. 7b, consists of a dorsal pair of sclerotized blades, apically attenuate and upturned; from ventral aspect apices convergent; central structure less than half length dorsal blades, curved only slightly ventrad, apex declivous from lateral aspect, from ventral view, fig. 7c, apex furcate, lateral lobes hooked, rounded.

Holotype, male.—Lunch Creek, Dixie Pass, 5,100 feet, Blue Mts., Grant County, Oregon, June 21, 1952, Borys Malkin.

Type deposited in the California Academy of Science, San Francisco, California.

Desmona n. gen.

General appearance resembles the *Hesperophylax,* but the genitalia and other characters are radically different. The characteristic spur count of 0-2-2 is found also in *Zaporota* Banks, described from Alaska, but other than that there is little similarity. The peculiar eighth tergite, spur count, venational characters and genitalia will distinguish this genus from other genera in the Limnephilidae.

Characteristics: Antennae about same length as wings, basal segment shorter than head; maxillary palpi prominent, second and third segments long, about same length. Mesoscutal warts subovate and delimited. Femora and tibia of forelegs margined entire length with combs of short, dense, black spines; femora with scattered black setae, tibia with two at apex, middle tibia with black spines scattered entire length; last segment of hind tarsi with no spines. Spurs yellowish and as follows: 0-2-2. Forewings, fig. 8a, broad, anterior margin rounded, stigma not marked, Sc not ending in cross-vein, distal part R_1 and R_2 subparallel, 2nd A absent, discal cell only slightly longer than pedicel. Hind wings not excised, discal cell closed, shorter than pedicel, cell R_2 not pedicellate, M three branched.

Genotype: *Desmona bethula,* new species.

Desmona bethula n. sp.

Male.—Length 14 mm. General color ferruginous, antennae, head, body and legs similar in color. Wings reddish-brown, apex darker, margin of cell M dark brown, translucent area through most of cell M, so that wing appears to have a silver stripe through dark apical portion. Cell M of fore-wings greater than half the length of the wing, cell M_1 of hind wings not pedicellate. First tarsal segment of forelegs about half length of second.

Genitalia as in fig. 8. Eighth tergite quite heavily sclerotized, apex produced caudad as a thin flat obtuse projection, fig. 8b. Ninth segment reduced dorsally to a narrow strap, ventral portion widened and produced dorso-caudad. Cerci quite prominent, viewed laterally, fig. 8, dorsal margin declivous, apical corner acute; from caudal aspect appear as a thin concave plate. Tenth tergite inconspicuous, not perceptible from lateral aspect; consists of a pair of separated plates, short (only a short distance above caudal surface), thin, as wide as cerci, dorsal margin irregular and bearing short pale setae. Claspers

well differentiated from remainder, apical portion extends caudad as a finger-like lobe beyond any other portion of genitalia; viewed dorsally or ventrally, fig. 8c, apical portion flat, subtruncate and wide; long yellowish setae abundant over main body. Aedeagus long, slender, cylindrical, apex blunt with distinct notch; lateral arms rather heavily sclerotized, straight, rod-like, acuminate, extend only slightly beyond main central portion, right arm slightly shorter than left, fig. 8d.

Female.—Length 13 mm. General appearance, size and color similar to male. Genitalia as in fig. 8e. Tenth tergite attenuated, apex acute, seen from dorsal aspect tergite bifid nearly entire length, setation sparse.

Holotype, male—Snag Lake, 7 miles N. Sierra City, Sierra Co., California, Oct. 26, 1952, R. L. Usinger.

Allotype.—Female.—same data as for holotype.

Paratypes.—Almanor Hatchery, Plumas Co., California, Oct. 1-15, 1948, 2 males, H. P. Chandler.

Parthina n. gen.

This new genus is the fifth Nearctic genus in the Odontoceridae. On the basis of the characters given below it can readily be separated from the other genera. It is probably most closely related to the *Psilotreta.*

General structure typical for family. Head wide, eyes small. Maxillary palpi with basal segment shortest, second and third segment subequal, fourth and fifth segments longest, subequal, fifth segment not articulate. Labial palpi with basal segment only slightly shorter than second, second segment about two-thirds length of third. Antennae (broken) with basal segment about as long as head, second segment ringlike, about two-thirds length of succeeding. Spurs 2-4-4, inner spurs longest; tibial spurs very hairy. Forewings, fig 9a, with no crossvein between Sc and R_1, R_1 and R_2 widely separated at tip, cell R_2 some distance on discal cell, cell R_4 pedicellate. Hind wings with R_2 and R_3 widely separated, cell R_4 pedicellate.

Genotype: *Parthina linea,* new species.

Parthina linea n. sp.

Male.—Length 6 mm. Legs and tibial spurs uniformly brownish and hairy; thorax, head, antennae brownish; maxillary and labial palpi light brown. Wings dark brown, densely covered with setae and a scattering of brownish scales over fore and hind wings; forewing subcostal cell near base reflexed, fold densely filled with erect blackish scales.

Genitalia as in fig. 9. Ninth segment widest laterally with a cephalid thumblike projection, narrowed both ventrad and dorsad, tergum projects caudad slightly beyond remainder. Tenth tergite composed of a pair of lateral, slightly convex plates, distal corner rounded and apex obliquely truncate; from dorsal aspect, fig. 9b, separated on meson, apices divergent. Cerci long, leaflike, bearing several long setae. Claspers with basal segment long, cylindrical, tapering toward apex and covered with long stout setae; apical segment short, apically acute and curved mesad, fig. 9c, no setae. Aedeagus with basal segment heavily sclerotized, tubular, apex hook-like; apical portion semi-

membranous, with a long slender acute ventral sclerite and arising from left side an internal apically acute sclerotized spinous rod reaching to apex.

Female.—Length 6 mm. Essentially similar in general appearance to male. Legs, spurs (2-4-4) and wings brownish and hairy, but scales lacking. Tenth tergum quite heavily sclerotized, projecting caudad as a thick blunt shelf, fig. 9d; from dorsal aspect fig. 9e, separated on meson, apically sub-acute and bearing several fairly long setae.

Holotype, male.—Strawberry, Tuolumne Co., California, June-July, 1951, E. L. Silver.

Allotype, female.—Same data as for holotype.

Paratypes.—Peavine Ridge, Near NcMinnville, Oregon, Aug. 16, 1948, Kenneth M. Fender, 2 females; same data except May 25, 1953, 1 male.

Paratypic females deposited in the Illinois Natural History Survey Collection Urbana, Illinois. These were kindly loaned to the writer by Dr. H. H. Ross of the Illinois Natural History Survey.

*Key to Genera of Odontoceridae**

1. Apex of wing rounded 2
   Apex of wing narrowed ..... *Marilia*
2. Cell R_4 pedicellate in fore and hind wing 3
   Cell R_4 not pedicellate in fore and hind wing 4
3. Cerci long, prominent; 10th tergite bearing a pair of hooks ..... *Psilotreta*
   Cerci short, slender, 10th tergite with no hooks ..... *Parthina*
4. R_1 fused with R_2 at tip in fore and hind wing ..... *Namamyia*
   R_1 not fused with R_2 ..... *Nerophilus*

Molannodes bergi Ross

This recently described species from the Matanuska Valley of Alaska constituted the first record of the genus in North America. The following record from the Yukon then, is also of considerable interest. Three males were collected along the Alaska Highway, Yukon Territory, Mile Post 1012, at Pine Creek, July 6, 1952, C. P. Alexander. Dr. C. P. Alexander states that Pine Creek is at the foot of the Dezadeash Mountains, the foothills of the St. Elias Range. The caddis flies were taken by sweeping the vegetation along the stream margin at dusk, the stream at this location is rather quiet-flowing and about 20 feet across.

The wing venation of *Molannodes bergi* Ross differs considerably from the usual type of venation found in the Molannidae. The writer is indebted to Dr. George F. Edmunds, Jr. of the University of Utah, for an interpretation of the wing venation. Apparently the stem of M is atrophied resulting in M_1 and M_2 appearing as a branch of R_{4+5}; M_3 is fused to Cu_{1a} and appears as a branch of that vein. In the fore wing, fig. 10, the veins are lettered to conform to the above interpretation.

* Adapted from Betten, 1934

RECORDS AND DESCRIPTIONS OF NORTH AMERICAN MEGACHILID BEES[1]

CHARLES D. MICHENER
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In the course of preparing a paper on the Californian species of certain megachilid bees in cooperation with Dr. P. D. Hurd, numerous new distributional records outside of California as well as some new species have come to light. The present paper has been written in order to bring our knowledge of these recently revised groups up to date and to make certain records and new names available for use in the above mentioned work. Dr. Hurd provided much help in bringing together the locality data.

The specimens recorded or described below come from many sources. I am indebted to each of the following for use of material under his care: Dr. W. F. Barr of the University of Idaho [U. I.]; Dr. G .E. Bohart of the Bureau of Entomology and Plant Quarantine, Logan Utah [G. E. B.]; Dr. G. D. Butler, Jr. of the University of Arizona [U. A.]; Dr. M. A. Cazier of the American Museum of Natural History [A. M. N. H.]; Dr. P. D. Hurd of the University of California, Berkeley [U. C., B.]; Dr. G. F. Knowlton of the Utah State Agricultural College [U. S. A. C.]; Mr A. T. McClay of the University of California, Davis [U. C., D.]; Dr. L. W. Quate of the University of Nebraska [U. N.]; Dr. E. S. Ross of the California Academy of Sciences [C. A. S.]; Dr. H. A. Scullen of Oregon State College [O. S. C.]; Mr. P. H. Timberlake of the University of California, Riverside [U. C., R.]. The letters in brackets are used to identify these collections in the following pages.

Considerable material in the Snow Entomological Museum of the University of Kansas [K. U.], mostly collected by Dr. R. H. Beamer or under his direction, is herein recorded for the first time.

Heriades cressoni Michener

NEBRASKA: Monroe Canyon, Sioux County, August 18, 1902, on Solidago (E. J. Taylor), August 15, 1908 (E. W. Dawson); Glen, Sioux County, 4000 feet altitude, August 20, 1906 (L. Bruner) [all U. N.]. UTAH: Bryce National Park (rim road), June 21, 1939, on *Senecio* (P. H. Timberlake) [U.C., R.]. WYOMING: Jenny Lake, Grand Tetons [G.E.B.].

Heriades leavitti leavitti Crawford

This form, formerly thought to be confined to the eastern and Gulf coasts, is now known to be widespread in the interior of the continent, as shown by the following records:

ILLINOIS: Carlinville (C. Robertson). NEBRASKA: Roca, on *Anthemes cotula,* June 28, 1910 (M. H. Swenk); Omaha, July 27, 1914, August 16 and 18, 1913, September 3, 1913 (L. T. Williams); Wyoming, on *Melilotus officinalis,* June 5, 1913 (M. H. Swenk) [all U. N.]. TEXAS: Salado Creek, Bexar County, March 21, 1952 (M. Wasbauer) [U. C., B.].

[1]Contribution Number 861 from the Department of Entomology, University of Kansas.

These records are based on males. Females are virtually indistinguishable from those of the much commoner *H. variolosus*, although the wings average darker.

Contrary to the synonymy indicated in a previous paper (Michener, 1938), the *carinatus* of Robertson (1903, Trans. Amer. Ent. Soc., 29:171) was *leavitti* mixed probably with females of *variolosus*.

Heriades leavitti crawfordi Graenicher

NORTH CAROLINA: New River, September 20 to 30, 1944 (G. E. Bohart) [G.E.B.]. FLORIDA: Orlando, March, 1944 (G. E. Bohart) [G.E.B.].

Heriades texana Michener

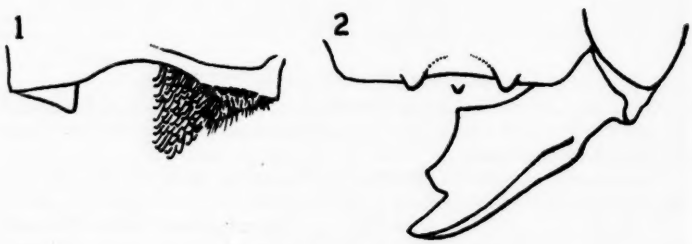
TEXAS: Uvalde, April 14, 1952 (Michener, Beamers, Wille, La Berge) [K. U.].

Heriades variolosa purpurascens Cockerell

TAMAULIPAS: Twenty miles north of El Limón, November 10, 1946 (E. S. Ross) [C. A. S.].

Heriades micropthalma new species

This species of the subgenus *Neotrypetes* superficially resembles the common and widespread species, *Heriades variolosa* (Cresson). It differs strikingly in both sexes from *variolosa* in the much smaller ocelli, which are usually separated by two or more diameters. In *variolosa* they are separated by little more than one diameter. In occasional specimens of *micropthalma* the posterior ocelli are less minute, but never as large as in *variolosa*. The tubercles which delimit the clypeal emargination of the female are simple and subacute, not double or crenulate as usual in *variolosa*. The first metasomal sternum of the male is rounded, not pointed as in *variolosa*. Other differences are indicated in the description. Small ocelli like those of *micropthalma* are known among American *Heriades* only in *H. micheneri* Timberlake which is very different as shown in the accompanying key.



EXPLANATION OF FIGURES

Heriades micropthalma. 1, posterior part of fifth metasomal sternum of male, vestiture omitted at left. 2. lower part of face and mandible of female.

H. micropthalma occurs in the desert areas from western Texas to Utah and Arizona. In most of this area *variolosa* is scarce or absent. It does, however, occur at Las Cruces, Mesilla, and Socorro, New Mexico, and *H. asteris* Cockerell from the first of these localities is clearly a synonym of *variolosa,* as indicated previously (Michener, 1938) and not the same as the present new species.

Female.—Length 6.5 mm. (varying from 5 to 7.5 mm. among paratypes). Pubescence white. Labrum with one basal tubercle; mandible with two widely separated longitudinal carinae extending to base, each of them slightly thickened and elevated between one third and one fourth of the distance from base to apex of mandible; because of these elevations the lower margin of the mandible appears slightly concave medially when seen from front; distance between first and second mandibular teeth less than that between second and third; malar space produced to a small tooth beneath; clypeus above as coarsely punctate as supraclypeal area; anterior margin of clypeus with emargination two thirds as wide as base of clypeus, delimited on each side by a sharp tubercle. Wings light brownish (paler than the average *variolosa*). First and second metasomal terga more finely punctate than others, the abdominal punctation essentially as in *variolosa variolosa.*

Male.—Length 5.5 mm. (varying to 6 mm. among paratypes). First segment of flagellum much broader than long; lower (or anterior) margin of mandible slightly convex basally; labrum with basal raised area. Legs black. First metasomal sternum produced far over second, its apex rounded, its profile elevated to a gentle convexity about two thirds of the distance from the base of the sternum to its apex; profile of sixth tergum straight apically; fifth sternum with dense masses of capitate hairs on either side of midline (figure 1); sixth sternum down curved at pointed apex, with dense subapical hair band, broken medially.

Holotype female.—Williams, ARIZONA, July 3, 1950 (Paul P. Cook) [K. U.]. Allotype male, same locality and date (R. H. Beamer) [K. U.]. Twenty three female and two male paratypes from the following localities: ARIZONA: Grand Canyon, August 19, 1939 (E. C. Van Dyke) [C. A. S.]. UTAH: Glendale, July, 1951 (G. F. Knowlton) [U. S. A. C.]. NEW MEXICO: Grant, on *Tetradymia canescens,* July 20, 1950 (C. D. Michener) [K.U.]; Rito, August, 1910 [K.U.]; Sandia Mountains, on *Monarda* and on *Melilotus officinalis,* July 17, 1952 (R. H. and L. D. Beamer, W. La Berge C. Liang [K.U.]; San Jose, on *Petalostemon,* July 21, 1950 (C. D. Michener) [K.U.]. TEXAS: Davis Mountains, Jeff Davis County, July 9 and 10, 1952 (H. A. Scullen) [O. S. C.]; Chisos Mountains, Big Bend National Park, July 3, 5, 9, and 10, 1942 (H. A. Scullen) [O. S. C.], July 4 and 6, 1942 (E. C. Van Dyke) [C. A. S.]; Big Bend, June 23, 1947 (R. E. Elbel) [K. U.].

Heriades micheneri Timberlake

ARIZONA: Baboquivari Mountains, October, 1924 (O. C. Poling); 17 miles south of Tucson, 2800 feet altitude, August 16, 1946 (H. A. Scullen); 10 miles north of Nogales, Santa Cruz County, 3700 feet altitude, August 16, 1946 (H. A. Scullen) [O. S. C.].

I am indebted to Mr. P. H. Timberlake for the loan of the only two previously known specimens of this species (holotype and allotype) in order to verify the identification. All known specimens are from a limited area in southern Arizona. Because three species of the subgenus *Neotrypetes* have been described since the genus *Heriades* was revised, the following new keys are presented. The subspecies of *leavitti* and *variolosa* are not considered in the keys.

Keys to the Species of Heriades, subgenus Neotrypetes

Females

1. Clypeus truncate or with broad, very shallow, apical emargination, as wide as basal width of clypeus 2
   Clypeus with median apical emargination narrower than basal width of clypeus 3
2. Basal end of ventral carina of mandible produced to a high tubercle or tooth less than half distance from base to apex of mandible; malar space with small ventral denticle (central Texas to southern Arizona) ..... *texana* Michener
   Neither mandibular carina produced to form a tubercle, but anterior face of mandible with strong horizontal subbasal ridge; malar space produced to large ventral tooth (New Mexico, Arizona) ..... *crucifera* Cockerell
3. Middorsal portions of metasomal terga with punctures rather small and well separated; no contrast in punctation between second and third terga (Central America) 4
   Middorsal portion of at least sixth tergum with punctures close, without shining interspaces; punctures of dorsal portions first two terga usually conspicuously finer than those of following terga. (North America) 5
4. Abdominal pubescence white (Panamá) ..... *currani* Michener
   Abdominal pubescence yellow or reddish (Costa Rica) ..... *bruneri* Titus
5. Ocelli large, separated by little more than their diameters 6
   Ocelli small, separated in most specimens by nearly twice their diameters 7
6. Apical half of wing usually darker brown (Nebraska and Texas to the Atlantic) ..... *leavitti* Crawford
   Apical half of wing usually paler brown (North America from Southern Canada to Yucatan; absent from southwestern deserts) ..... *variolosa* Cresson
7. Mandibular carinae low and uniform throughout; clypeal emargination minutely denticulate (Southern Arizona) ..... *micheneri* Timberlake
   Mandibular carinae both elevated before middle; clypeal emargination smooth (West Texas to Utah and Arizona) ..... *micropthalma* Michener

Males

1. Apex of first metasomal sternum broadly truncate, the sternum medially produced to large high tubercle which is acute seen in

profile (this sternum suggestive of that of the subgenus *Physostetha*) ..... *micheneri* Timberlake
First metasomal sternum produced to a rounded or pointed apex, the sternum only gently elevated medially 2
2. First metasomal sternum produced to a pointed apex; anterior legs normally partly red ..... *variolosa* Cresson
First metasomal sternum with apex rounded; anterior legs black except in rare individual variants 3
3. First metasomal sternum with ventral elevation more than two thirds of distance from base to apex 4
First metasomal sternum with ventral elevation less than two thirds of distance from base to apex 6
4. Fourth metasomal tergum with punctures much coarser than those of second; subapical hair of sixth sternum soft and white ..... *crucifera* Cockerell
Fourth metasomal tergum with punctures not coarser than those of second; subapical hair of sixth sternum (at least in *currani*) consisting of a row of coarse, amber spatulate hairs extending in full width of sternum 5
5. Abdominal pubescence white ..... *currani* Michener
Abdominal pubescence yellow ..... *bruneri* Titus
6. Ocelli large, separated by little more than their diameters ..... *leavitti* Crawford
Ocelli small, usually separated by nearly twice an ocellar diameter ..... *micropthalma* Michener

Chelostoma phaceliae Michener

NEVADA: Dagget Pass, Douglas County, June 16, 1952 (E. I. Schlinger) [U. C., D.]. WASHINGTON: Asotin, June 25, 1936 (I. McCracken) [C. A. S.]. UTAH: Logan, June 4, 1948 and July 14, 1947, the latter on *Phacelia linearis* (all G. E. Bohart) [G. E. B.].

Chelostoma marginatum incisuloides new subspecies

As will be reported elsewhere, the forms such as *marginatum* previously considered as subspecies of *C. minutum* Crawford are good species as indicated by their overlapping distributions and distinct morphological differences. The most characteristic specific character of *marginatum* is the fringe of the fifth sternum of the male which occupies only the median part of the sternal margin and consists of pale bristles which are unbranched but wavy apically.

C. marginatum marginatum is known from southern California, northward in arid regions east of the Sierra Nevada at least to the Argus Mountains, Inyo County. West of the Sierra Nevada in central California another form, *incisuloides,* occurs, as described below:

Male.—Differs from typical *marginatum* in that the median teeth of the seventh metasomal tergum are fused almost to their apices, so that the emargination between them is only about as wide as deep.

Female.—Differs from *marginatum* in the somewhat longer head, so that a line drawn tangent to the summits of the eyes passes a full ocellar diameter in front of the median ocellus.

Holotype male, allotype female, and seven male paratypes: San Joaquin Experiment Station (near O'Neals), Madera County, CALIFORNIA, April 18, 1953 P. D. Hurd) [U. C., B.]. Most of these specimens were on *Phacelia platyloba* but one paratype was on *Amsinckia* and two on *Cryptantha.* The holotype and allotype are in the Snow Entomological Museum, University of Kansas.

Three additional specimens of this subspecies, all from CALIFORNIA, are listed as follows: five miles south of Three Rivers, on *Pentstemon laetus,* May 1, 1947 (P. H. Timberlake) [U. C., R.]; Mount Diablo, Contra Costa County, on *Eriodictyon,* April 21, 1953 (P. D. Hurd) [U. C., B.]; Adobe Creek, west Stanislaus County, May 6, 1948 (R. F. Smith) [U. C., B.].

It is strange that in its principal distinctive feature, the shape of the seventh metasomal tergum of the male, this species agrees with the closely related but distinct species, *C. incisulum* Michener. *C. incisulum* and *C. marginatum incisuloides* occupy the same range so far as known from meager records. It would be interesting to know if the *incisulum*-like characteristics of *incisuloides* resulted from introgression of genes from *incisulum* into the northern populations of *marginatum.*

A series of females collected with the types on April 18, 1953, have shorter heads and appear to be *C. incisulum.* This view is supported by three males of *incisulum* collected at the type locality on March 24, 1953, at which time no other *Chelostoma* were taken. This meager evidence suggests that the season of flight of *C. incisulum* may be earlier at this locality than that of *C. marginatum incisuloides.*

Chelostomopsis rubifloris (Cockerell)

OREGON: Klamath Falls, May 9, 1924 (C. L. Fox) [C. A. S.]; Eagle Ridge, Klamath Lake, May 14, 1924 (C. L. Fox) [C. A. S.]; Griffith Creek, Jackson County, June 29, 1951 (A. T. McClay) [U. C., D.].

Proteriades palmarum (Cockerell)

This rare black *Proteriades* is evidently quite variable and it seems almost certain that *P. nigra* Timberlake and Michener is a synonym since the characters mentioned to distinguish *nigra* when it was described appear, in the light of the three more females now available, to vary within populations and seem not to be correlated with one another.

The male of *palmarum* has not been previously described.

Male.—Length 5.5 mm. Black, tegulae and apical margins of first six metasomal terga translucent testaceous, apical halves of mandibles red, flagellum brown beneath, tarsi dark brownish, wings hyaline with veins and stigma dark brown. Head much broader than long, slightly broader than thorax; genal areas two-thirds as wide as eyes seen from side, widest below middle of eyes; antennae with middle segments of flagellum as long as wide; margin of clypeus with broad, somewhat crenulate, slightly concave truncation, the margin of which is thickened and broadly impunctate, this trunca-

tion considerably broader than labrum and limited by distinct angles; mandibles with outer tooth much longer and more slender than inner. Middle coxae each with a small tooth in front of base of trochanter; hind coxae with inner ventral carinae very high but scarcely lamellate. Sixth metasomal tergum with distinct but rounded tooth on each side, tergal margin basad of tooth slightly concave; seventh tergum produced to truncate apex less than half as wide as base of tergum; first sternum evenly convex across apex where it is only slightly elevated above following sternum, pubescence sparse, evenly distributed except for being somewhat denser along posterior margin; second sternum without definite preapical swelling; apical fringes on second to fifth sterna very long and white, these sternal margins straight or the more posterior ones gently concave; ferruginous median fold on sixth sternum well developed, long, narrowly flattened at summit, apex not produced as spine, short pubescence not modified. Head and thorax finely and closely punctured, punctures dense and very fine on face below middle, coarser on frons and vertex; punctures of mesoscutum not or scarcely coarser than those of vertex, those of mesepisterna distinctly coarser than those of mesoscutum and genal areas. Pubescence white, not particularly dense, the abdominal bands broken (or worn) medially.

The male described above was collected with two females at Borego, San Diego County, California, on *Cryptantha barbigera*, March 31 and April 1, 1953 (P. D. Hurd) [U. C., B.].

Proteriades incanescens nevadensis Timberlake and Michener

The male of this species is here described for the first time.

Male.—Length 5.5 to 6.5 mm. Black, including abdominal sterna; first to third metasomal terga red, fourth red except for middorsal spot; posterior margins of terga broadly testaceous; mandibles reddish subapically; flagellum dark brown, paler beneath; wings dusky hyaline, stigma and veins black. Head much broader than long, inner orbits nearly parallel, genal areas about as broad as eyes from side; distance between posterior ocelli distinctly less than distance from one of them to posterior margin of vertex or to eye margin; clypeal margin broadly convexly rounded, slightly crenulate, angulate sublaterally, margin not thickened; mandible with outer tooth acute, inner tooth ending in about a right angle and much shorter than outer; maxillary palpi five-segmented; hairs of galeae and labial palpi sparse and scarcely hooked; hypostomal carinae rather low; flagellar segments all longer than broad, second the shortest, middle segments about one and one-half times as long as broad; upper surface of flagellum clothed with longer hairs than lower surface, those of basal segments particularly long, some of them more than half as long as diameter of flagellum. Middle coxae not toothed; posterior coxae not lamellate, carinae almost absent, but inner ventral surfaces distinctly swollen. Sixth metasomal tergum with a distinct acute tooth at each side; sides of seventh tergum gently concave, apex strongly bilobed, emargination between lobes much deeper than a semicircle and about three times as wide as one of the lobes, each lobe rather long and parallel sided, obliquely truncate apically; first metasomal sternum flat, sparsely pubescent except for irregular fringe along posterior margin, second sternum

without swellings, greatly expanded posteriorly so that third is entirely concealed medially, posterior margin of second broadly convex; third sternum with broad median emargination involving almost entire width of sternum and with a fringe only medially, this fringe completely covered by second sternum in repose; fourth sternum with posterior margin straight medially, convex laterally, fringed with yellowish hairs; fifth sternum with margin gently convex, similarly fringed; sixth sternum with light brown median fold continued as slender projection between two broad apical lobes, no specialized short pubescence present on fold or projection. Pubescence of head and thorax rather fine, that of vertex slightly coarser and closer than that of mesoscutum; clypeal margin broadly impuncate and shining. Pubescence white, brownish dorsally, largely covering face, not forming abdominal bands.

CALIFORNIA: Blanco's Corral, White Mountains, Mono County, 10,000 feet elevation, June 29, 30, and July 8, 1953 (J. W. Mac Swain) [U. C., B.]. One female, several males.

The male of this species is unique among known *Proteriades* in having the second metasomal sternum enlarged, the third emarginate, as in many *Anthocopa* and *Osmia*. Remarkable as this character may be, it is closely approached by the male of *remotula* and there seems no reason to doubt the association of these males with the female *incanescens*, especially since the presumed male of *incanescens* agrees with that of the related species, *remotula*, in the near absence of hooks on the hairs of the mouthparts.

Proteriades incanescens tota new subspecies

Female.—Length 7 mm (6.5 in paratype). This subspecies is similar to *P. i. nevadensis* but is larger in size, lacks red coloration on the abdomen and has distinctly dusky wings. The distance between the posterior ocelli is considerably less than the distance from one of them to the eye margin.

Holotype female.—Strawberry, Tuolumne County, CALIFORNIA, July 1, 1951 (J. J. Drea) [K. U.]. One paratype female: Pinecrest, Tuolumne County, CALIFORNIA, July 12, 1953 (B. L. Rozen) [U. C., B.].

Proteriades nigrella new species

This species is very small, like *P. pygmaea* and *nanula*, but differs from them in lacking red markings or in having them confined to the first two metasomal terga; in the much coarser punctation, the large and widely separated punctures of the clypeus of the female being especially conspicuous; in the strongly angled sides of the sixth metasomal tergum of the male; in the more nearly equal mandibular teeth of the male; and in the more definitely truncate clypeus of the female.

Female.—Black, posterior margins of metasomal terga broadly testaceous, apical portions of mandibles red (the teeth dark); flagellum brown beneath. Mandibles constricted basad of middle, not much broadened apically, teeth all acute, distance between lower and middle tooth less than that between middle and upper tooth; maxillary palpi tapering, four segmented; distance between posterior ocelli subequal to distance from one of them to eye margin, greater than distance from one of them to posterior margin of vertex. Clypeus

broadly truncate, angles limiting truncation rounded, sublateral angles distinct and closer to ends of truncation than to lateral angles of clypeus; clypeus unusually coarsely punctured, punctures separated by considerable shining ground medially; head and thorax otherwise considerably more finely punctured, punctures separated by less than a puncture width; wings feebly dusky, veins and stigma black. Punctures of abdomen finer than those of thorax, separated by more than a puncture width in some areas middorsally but close laterally; pubescence moderately dense and whitish, first five terga with narrow apical hair bands, fifth and sixth terga with white pubescence scattered over surfaces.

Type material: see *P. nigrella nigrella* below.

Proteriades nigrella nigrella new subspecies

Female.—Length 4 mm. (varying to 3.5 among paratypes). Abdomen without red areas; tegulae translucent brown.

Holotype female and seven female paratypes: Box Canyon, Riverside County, California, on *Cryptantha angustifolia,* April 17, 1952 (P. H. Timberlake) [U.C.,R.]. One female paratype: Twenty-two miles north of Manix, San Bernardino County, California, on *Cryptantha angustifolia,* April 26, 1953 (P. D. Hurd) [U. C., B.].

Proteriades nigrella attonita new subspecies

Female.—Length 5 mm. Sides of first metasomal tergum and extreme sides of second red; tegulae nearly black.

Male.—Length 4 mm. Coloration as in female though red at sides of metasoma basally very dark and inconspicuous. Head broader than long; inner orbits converging below; genal areas more than half as wide as eyes seen from sides; clypeal truncation not quite as wide as base of labrum, limited by distinct angles, its margin broadly impunctate, not thickened, scarcely crenulate; mandibles with teeth acute, outer one not greatly longer than inner; hypostomal carinae low; distance between posterior ocelli scarcely greater than distance from one of them to eye margin, distinctly greater than distance to posterior margin of vertex; middle segments of flagellum about as broad as long. Punctation of head and thorax rather coarse, that of mesepisterna slightly finer than that of mesoscutum, the latter coarser than that of head. Middle coaxae not toothed. Tooth on each side of sixth metasomal tergum distinct, acute, though apex rounded; seventh tergum with apex narrow and distinctly bilobed because of rather deep median emargination; first sternum sparsely pubescent, evenly convex across apex; second sternum without preapical swelling, its apical fringe long, similar to that of third, fourth and fifth sterna; apical margin of second sternum weakly emarginate medially; third and fourth sterna distinctly and rather broadly emarginate medially, fringe of fourth sternum conforming to this emargination but that of third not so, hairs of median portion longer than those elsewhere; sixth sternum with the usual ferruginous median fold. Pubescence white, rather dense on the face but surface not completely hidden by it; bands of metasomal terga not evident (perhaps worn off).

Holotype female, allotype male, and one female paratype: Suprise Canyon, Inyo County, CALIFORNIA, on *Cryptantha racemosa*, April 29, 1953 (P. D. Hurd and G. A. Marsh) [K. U.].

Ashmeadiella californica florissantensis Michener

WYOMING: Jenny Lake, Grand Tetons National Park, July [G. E. B.]. IDAHO: Lewiston, July 18, 1925 (C. L. Fox) [C. A. S.].

Ashmeadiella difugita emarginatula Michener

NEVADA: Charleston Mountains, 9000 feet altitude, June 21, 1940 (R. M. Bohart) [G. E. B.]; twenty-five miles northwest of Gerlach, Washoe County, May 29, 1939 (P. C. Ting, M. A. Cazier, J. A. Downes, T. Aitken) [U. C., B.]. OREGON: Steens Mountains, 7000 feet altitude, June 9, 1927 (H. A. Scullen) [O. S. C.]. IDAHO: Twelve miles south of Rock Creek, Twin Falls County, July 1, 1951; five miles northeast of Midvale, Washington County, July 9, 1952, on *Eriogonum;* Coyote Grande, Nez Pearce County, on *Grindelia,* August 15, 1951 (all W. F. Barr) [U. I.]. The species is new to each of the states listed above. The femora are black or largely so in each specimen listed. Only one or two specimens were collected at each of the localities listed.

Ashmeadiella femorata (Michener)

NEVADA: Six miles south of Las Vegas, April 6, 1953 (Libby Smith) [U. C., B.].

Ashmeadiella cactorum cactorum (Cockerell)

WYOMING: Newcastle, June (M. Cary) [U. N.].

Ashmeadiella aridula aridula Cockerell

WYOMING: Worland, July 5, 1947 (L. Bruner) [U. N.] (three females). IDAHO: Downey, on *Solidago,* August 19, 1947 [K. U.] (one female). UTAH: Santa Clara, June 21, 1950 (G. F. Knowlton) [U. S. A. C.] (one female).

Ashmeadiella aridula astragali Michener

WYOMING: Grand Teton National Park, July, 1937 (R. M. and G. E. Bohart) [G. E. B.] (a single male.) This specimen is from a point well within the range of the subspecies *aridula,* although it agrees with *astragali.* It is recorded under *astragali* since there is a possibility that these subspecies overlap broadly geographically while occupying ecologically different zones.

One of two female specimens from Topaz Lake, Mono County, California, August 17, 1951 (E. I. Schlinger) [U. C., D.] lacks tegular punctures and therefore agrees in this respect with the subspecies *aridula* proper, although collected with a specimen of the subspecies *astragali* and within the range of that subspecies.

Ashmeadiella foveata Michener

The male of this species is here described for the first time.

Male.—Length 4.5 to 6 mm. Similar to female (see Michener, 1939) except for the usual sexual characters. Clypeus as coarsely punctured as frons and vertex; emargination of apical edge of clypeus much shorter than basal

width of clypeus and demarked by rather distinct angles; pubescence of clypeus not dense, not obscuring surface; distance between posterior ocelli slightly greater than distance to eye margin or to posterior edge of vertex. Tegulae black (also true of many females); mesepisterna more coarsely punctured than mesoscutum. Abdominal terga with punctures slightly coarser than those of mesoscutum; median teeth of sixth tergum fully as long as basal width, rather slender apically, having much the form of these teeth in species in which the teeth are much longer (It seems likely that specimens will be found having teeth conspicuously longer than broad.), emargination between these teeth slightly deeper than a semicircle.

CALIFORNIA: Mount Diablo, April 21, 1953 (P. D. Hurd) [U. C., B.].

In the key to the species of *Ashmeadiella* (Michener, 1939) the male of this species runs either to couplet 31 or to *gillettei* in couplet 24. It differs from Pacific coast populations of the latter species in the entirely black abdomen among other characters. The following additional records are based upon females:

NEVADA: Twenty-five miles northwest of Gerlach, Washoe County, May 29, 1939 (P. C. Ting, M. A. Cazier, J. A. Downes, T. Aiken) [U. C., R.]; Mount Montgomery, 7000 feet altitude, June 21, 1942 (R. M. Bohart) [G. E. B.]. UTAH: Ninety miles west of Hinckley, June 29, 1950 (C. D. Michener) [K. U.]. ARIZONA: Maricopa Mountains, April 14, 1947 (H. and M. Townes) [K. U.].

Ashmeadiella altadenae Michener

The hitherto undescribed female of this species appears to be represented by the single specimen from very near the type locality described below:

Female.—Length 5 mm. Pubescence pale brown, that of dorsum of head and thorax darkest, that of other areas much whiter; inner margins of eyes distinctly converging toward clypeus; face measured from outer margins of the eyes much broader than long; clypeus very finely and closely punctuate, anterior margin broadly reddish brown, truncation narrowly impunctate, width of truncation conspicuously shorter than distance from its end to eye margin, ends of truncation prominent; mandibles largely red except for the dark bases, distance from first to third mandibular tooth much less than width of eye, less than length of last three antennal segments taken together; distance from apex of lower tooth to apex of middle tooth distinctly more than that from apex of middle to upper tooth; frons and vertex distinctly more coarsely and less closely punctured than clypeus but genal areas more finely punctured, like clypeus; anterior ocellus farther from antennal bases than from posterior margin of vertex (but much nearer midpoint than in *rufitarsis*), distance between posterior ocelli slightly less than distance from one of them to eye margin or to posterior edge of vertex; mouthparts short, much as in *rufitarsis* but with maxillary palpi four-segmented instead of two segmented. Mesoscutum with punctures similar to those of vertex but slightly coarser, anterior margin rather densely hairy but without spots of especially dense pubescence; tegulae testaceous; mesepisterna with punctation middorsally distinctly finer than that of mesoscutum but laterally nearly as coarse as that of mesoscutum; punctures of dorsum of second tergum separated by a little

less than a puncture width; sides of first tergum largely red; posterior margins of terga testaceous; first five metasomal terga with apical whitish bands of pubescence; scopa thin, whitish; sixth matasomal sternum with broad transverse concavity in which the punctures are rather widely separated but not particularly larger than those elsewhere on sterna, surface between punctures minutely roughened and dull, concavity broader than convex space behind it.

CALIFORNIA: Arroyo Seco, San Gabriel Mountains, July 6. [K. U.].

In the key to the species of *Ashmeadiella* (Michener, 1939) this species runs to *rufitarsis* to which it is undoubtedly closely related. It differs from *rufitarsis* not only in the four-segmented maxillary palpi but in having the clypeal punctation much finer than that of the frons. It must be admitted that since males and females of this species have yet to be collected together, some doubt exists as to the correct association of the sexes, but in view of the peculiarities of the mouth parts this doubt seems extremely small.

Ashmeadiella bigeloviae (Cockerell)

NEVADA: Twenty-two miles south of Las Vegas, on a composite, April 3, 1953 (J. W. Mac Swain) [U. C., B.].

Ashmeadiella digiticauda Cockerell

BAJA CALIFORNIA: Fifteen miles north of San Ignacio, September 29, 1941 (Ross and Bohart) [C. A. S.]; Las Animas, Sierra Laguna, October 12, 1941 Ross and Bohart) [C. A. S.].

Ashmeadiella gillettei gillettei Titus

NEBRASKA: Harrison, on *Stenopetalum,* June 11, 1910 (L. Bruner) [U. N.]. A single female with the abdomen entirely black. SOUTH DAKOTA: Badlands National Monument. June 3, 1943 (G. R. Ferguson) [O. S. C.]. A single black female.

Ashmeadiella occipitalis Michener

SONORA: Hermosillo, September 12, 1938 (R. H. Crandall) [U. A.]. BAJA CALIFORNIA: Fifteen miles north of San Ignacio, September 29, 1941 (Ross and Bohart) [C. A. S.].

A remarkable feature of this species, not previously described, is the sixth sternum of the female. The exposed part of this sternum is entirely shallowly concave and coarsely punctate, the concavity being emphasized by the fact that the posterolateral margins of the sternum are produced posteroventrally as broad rounded rims extending beyond the margin of the tergum and hence visible from above.

Ashmeadiella leucozona Cockerell

ARIZONA: Phoenix, April 24, 1933 (R. H. Crandall) [U. A.].

Ashmeadiella sonora Michener

BAJA CALIFORNIA: Ten miles east of San Ignacio, September 30, 1941 (Ross and Bohart); Coyote Cove, Conception Bay, October 1, 1941 (Ross and Bohart) [all C. A. S.]. UTAH: Moab, August 11, 1947 (G. F. Knowlton) [U. S. A. C.].

Aashmeadiella opuntiae (Cockerell)

UTAH: Zion Lodge, June 20, 1939 (P H. Timberlake) [U. C., R.]; Tintic, June 18, 1952 (G. E. Bohart and E. A. Cross) [G.E.B.].

Ashmeadiella pronitens (Cockerell)

COLORADO: Ragget Mountain, Gunnison County, June 28, 1950 (O. A. Downing) [U. C., D.].

Ashmeadiella cubiceps cubiceps (Cresson)

A single male, presumably of this subspecies, is from Hurricane Creek, Wallawa Mountains, OREGON, August 7, 1950 (Grace H. and John L. Sperry) [U. C., R.]. The specimen is badly worn but apparently is not distinguishable from the male of the subspecies *clypeata,* described previously (Michener, 1939).

Ashmeadiella timberlaki solida Michener

NEVADA: Carson City, May 25, 1952 (E. I. Schlinger) [U. C., D.].

Ashmeadiella lutzi Cockerell

UTAH: Logan Canyon, 7500 feet altitude, on *Phacelia heterophylla,* July 4, 1947 (G. E. Bohart) [G. E. B.].

Ashmeadiella australis (Cockerell)

UTAH: Beaver Canyon, June 11, 1946 (R. M. Bohart) [G. E. B.]; Red Rock Canyon, June, 1950 (G. F. Knowlton) [U. S. C.].

Ashmeadiella stenognatha Michener

The record below represents the second collection of this species and the first known males.

Male.—Length 4.5 to 5 mm. Agrees with *A. salviae* Michener as described (Michener, 1939) but smaller; clypeal emargination slightly deeper although broad and not demarked by distinct angles; abdomen with more red, especially posteriorly, so that less than the median third of any tergum is black and on the fifth and sixth terga the black is reduced to median spots, that of the sixth smallest.

CALIFORNIA: San Joaquin Experiment Station (near O'Neals), Madera County, on *Phacelia platyloba,* April 18, 1953 (P. D. Hurd) [U. C., B.].

Ashmeadiella clypeodentata Michener

BAJA CALIFORNIA: Twenty miles west of Mexicali, on *Prosopis,* April, 1939 (C. D. Michener) [K. U.].

Ashmeadiella breviceps Michener

BAJA CALIFORNIA: Twenty miles west of Mexicali, on *Prosopis,* April, 1939 (C. D. Michener) [K.U.]. SONORA: Halfway between Sonoyta and Punto Penasco, 500 feet altitude, March 3, 1949 (G. M. Bradt) [A. M. N. H.].

Ashmeadiella rhodognatha Cockerell

BAJA CALIFORNIA: El Mayor, on *Prosopis,* April, 1939 (C. D. Michener) [K.U.]; twelve miles south of Palacio, on *Prosopis,* April, 1939 (C. D. Mich-

ener) [K. U.]; twenty miles west of Mexicali, on *Prosopis,* April, 1939 (C. D. Michener) [K. U.]. NEVADA: Twenty-nine miles east of Reno, on *Dalea polyadenia,* June 12, 1952 (R. H. and L. D. Beamer, W. La Berge, A. Wolf, C. Liang, C. Weiner) [K. U.].

Ashmeadiella xenomastax Michener

SONORA: Halfway between Sonoyta and Punto Penasco, 500 feet altitude, March 25, 1949 (G. M. Bradt) [A. M. N. H.].

Diceratosmia subfasciata subfasciata (Cresson)

ARIZONA: Tucson, June 16, 1938 (R. H. Crandall) [U. A.]; Yuma, June 26, 1951 (L. A. Carruth) [U. A.].

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A NEW SPECIES OF *HEBRUS* CURTIS FROM THE PHILIPPINE ISLANDS (Hemiptera, Hebridae)

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Michigan State College
East Lansing

The following new species of *Hebrus* Curtis was discovered while studying the Hebridae of the Philippine Islands in the Snow Entomological Museum.

Hebrus haddeni n. sp.

Size.—Male; length, 1.91 mm. to 2.00 mm.; width across humeri, 0.85 mm. to 0.93 mm. Female; length, 2.15 mm.; width across humeri, 0.97 mm.

Color.—Head fuscous, clypeus and tylus lighter, compound eyes ferreo-fumate to fusco-fumate, ocelli fuscous, shiny, antennae fuscous to testaceous-fuscous, all segments approximately concolorous; pronotum fuscous, darker on humeri and lateral border of anterior lobe, collar fuscous, median portion lighter than lateral portion; scutellum fuscous, darker than pronotum; hemelytra with veins fuscous, membranous area of corium fumate, base of clavus fumate, irregular distal area fulginous, membrane fulginous with paler irregular oval area at distal end of vein. Underparts: head with buccula testaceous to testaceous-fuscous, rostrum testaceous, sternal ridges fuscous, legs testaceous, distal segments darker; venter fuscous, distal segments lighter than proximal segments.

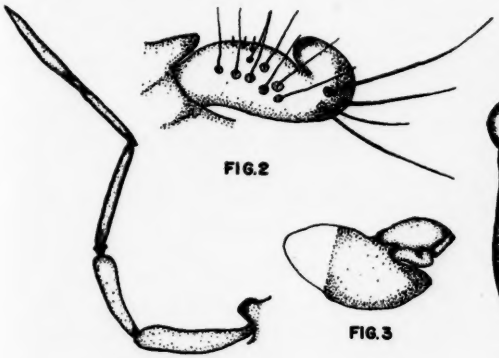
Structural characteristics.—Vertex of head without medial longitudinal sulcus, two anastomosing rows of pits in this area, frons tumid, antennae (fig. 1) with basal segments extending slightly less than half their lengths beyond tylus, first and second segments stout, third, fourth and fifth filiform; pronotum with collar punctate on posterior border, with medial longitudinal

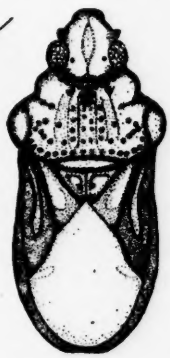
sulcus on discs, deepest part of sulcus at juncture of anterior and posterior lobes, becoming shallower forward to collar, two rows of pits in sulcus and row of pits along exterior edge of border, humeri impressed within, row of coarse punctures in depression, punctures continuing near posterior border of pronotum as an acupunctate line, humeri prominent and angulate, both discs of pronotum punctate, discs demarcated by row of coarse punctures; scutellum with medial longitudinal carina, incised at apex, lateral edges upturned; hemelytra with inner veins produced at claval angles, membranes extending nearly to tip of abdomen; males with abdomen more constricted than females, connexivum turned upward in both sexes. Underparts: rostrum extending nearly to posterior border of metasternum, buccula prominent and pitted; sternal ridges of prosternum reduced, prominent on mesosternum and metasternum, collar with pits along posterior border, pits which demarcate posterior and anterior discs continue downward to sternum, pleura punctate, sterna punctate; parameres of male with hooks recurved, scattered long setae on distal portion.

Comparative notes.—Near *Hebrus burmeisteri* L. & S. but may be readily separated by the incised apex of *H. haddeni* while *H. burmeisteri* has scutellum truncate or rounded at apex, parameres of *H. haddeni* are recurved at distal end while those of *H. burmeisteri* are curved sharply upward, being nearly angulate; veins of hemelytra of *H. haddeni* are produced at claval angle and those of *H. burmeisteri* are rounded at claval angle.

Location of types.—Holotype male and allotype female in the Snow Entomological Museum; paratypes, 1 male in the Snow Entomological Museum and 1 male in the collection of the author. All specimens bear the label Mt. Makiling, Laguna, P. I., F. C. Hadden Collector, no data as to date taken.

Data on distribution.—Known only from type locality.





EXPLANATION FOR PLATE:

Fig. 1 antenna of *Hebrus haddeni* n.sp.
Fig. 2. paramere of male.
Fig. 3 genital capsule of male.
Fig. 4 adult female *Hebrus haddeni* n. sp.

TWO NEW SUBSPECIES OF *EREBIA EPIPSODEA* BUTLER (Lepidoptera: Satyridae)[1]

PAUL R. EHRLICH
Lawrence, Kansas

The subspecies named below will be fully described, with a discussion of the nomenclatorial and biological problems involved, in a full report on *Erebia epipsodea* Butler which has been submitted for publication. Because of a delay in the printing of the larger paper, it seems best to validate the new names here.

Erebia epipsodea hopfingeri new subspecies

This subspecies is distinguished from *E. e. epipsodea* by its larger size, proportionately smaller submarginal patches, and darker ground color. It differs from *E. e. remingtoni* Ehrlich in having a complete set of ocelli on the underside of the secondaries.

Type material.—Holotype male and allotype female, Black Canyon 1000 feet, South of Methow, Okanogan County, Washington, May 24, 1952 (J. C. Hopfinger). There are 53 male and 13 female paratypes from various localities in Washington and Oregon.

The holotype and allotype have been deposited in the American Museum of Natural History; the paratypes have been widely distributed.

Erebia epipsodea freemani new subspecies

This subspecies differs from the other three subspecies of *epipsodea* in the lighter color and sharper outline of the submarginal patches.

Type material.—Holotype male, Lloydminster, Alberta, June 8, 1946 (P. F. Bruggemann); allotype female, same locality, June 13, 1948 (P. F. Bruggemann). There are 60 male and 17 female paratypes from various localities in Alberta, Saskatchewan, and Manitoba.

Types distributed as in *hopfingeri.*

FIRST FLORIDA RECORD FOR *HYDROMETRA CONSIMILIS* BARBER

H. B. HUNGERFORD

This striking species, which was described from Puerto Rico and has been recorded from Jamaica, Cuba, Haiti, and Mexico by Drake and Hottes (1952), has also been taken in Florida. In the Snow Entomological Museum we find six specimens labeled "L. Matecumba Key, Fla., III-14-47." Four were taken by L. D. Beamer and two by R. H. Beamer.

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[1]Contribution No. 867 from Department of Entomology, University of Kansas, Lawrence.

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